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The February number of the OPHTHALMIC RECORD will contain amongst others, an original article by A. Levi, M. D., "A contribution to the study of injuries of the eye;" one by Geo. E. de Schweinitz, M. D., "A word concerning the etiological relationship of epidemic influenza to Chronic Glaucoma;" one by P. Chalmers Jameson, M. D., "Report on the treatment of Trachoma with notes upon the construction of an instrument devised for the purpose." There will also appear Editorials, Reviews, Abstracts, Society Reports and Personals and Items of interet to the profession.

The RECORD particularly desires short practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the RECORD exclusively. Illustrative cuts will be made at the expense of the journal, and proofs forcorrection will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The RECORD will be issued monthly, and each number will contain about 54 pages of reading matter.

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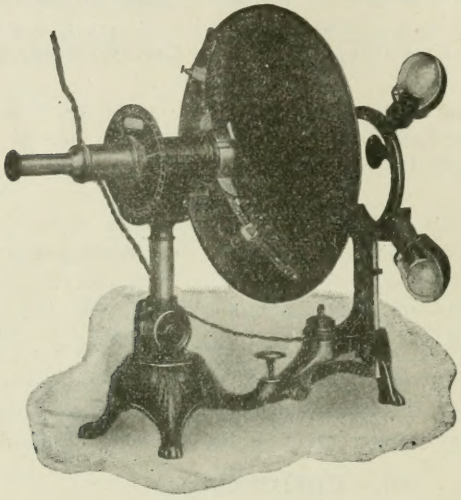

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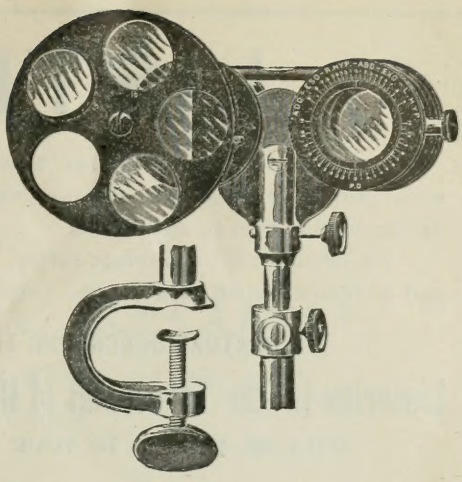

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THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME X. CHICAGO, JANUARY, 1901. No 1. NEW SERIES

ORIGINAL ARTICLES.

HYSTERICAL ALOPECIA OF THE EYELIDS.*

BY H. GIFFORD, M. D.,
OMAHA, NEB.

Three years ago, within a short interval, two cases presented themselves at my office which puzzled me. The patients were both girls about 10 years of age whose parents were worried on account of the falling out of their eyelashes. On examining them, the lashes were found to be scanty, entirely wanting for an occasional short space, and of those that were present quite a number were short. There were, however, none of the ordinary evidences of inflammation about the roots of the lashes, no redness, no crusts nor excoriations. There were no marked errors of refraction and for want of something better I ordered the ordinary yellow ointment and let them go with a feeling that if they got better it would not be on account of their visit to me. One of the girls I never saw again, but two years later a letter was received from the parents of the other, stating that the falling out of the lashes, which had been better for a time, was now worse again, and that at the times when the lashes came out most, the edges of the lids got quite inflamed for a day or two. This and some other hysterical cases, which in the meantime I had treated, suggested the idea that the child was pulling out her lashes; so I sent for her and had her left at the hospital. Her

* Read at the Omaha Medical Society's meeting, Sept. 11, 1900.

lids now had hardly any normal lashes, but were free from any signs of inflammation. I applied an indifferent ointment to the edges of the lids, but kept one eye covered with cotton fastened at the edges with collodion, while the other was left free. At the end of two weeks this process was rewarded by quite a fine growth of lashes on the eyelids that had been covered, while the lashes of the other eye presented much the same stubby and ragged appearance as at first. I now had a heart to heart talk with the girl and without formally accusing her of pulling the lashes out, I assured her that if she would leave them alone there would be no further trouble and that I would not say anything to her parents about what I thought had been the matter with them. She promised to be good and she and her parents have had no further trouble.

Since then I have had two other cases of the same sort which have been cured by moral suasion without the necessity of tying up either eye. One of these is a girl of 15, the other of 11 years. The latter is the daughter of a physician and presented the variation of having lost a good deal of the eye-brows as well as the eye-lashes. She had been taken to several oculists who had eventually referred her to skin specialists. This girl owned up on my first private interview with her that she got started in the practice by some of her family pulling out alleged wild hairs. Only one of these girls presented any or the ordinary signs of the hysterical temperament. The others were bright, cheerful little things, the one first mentioned in particular making herself at home at once in a strange hospital and being so useful as to be a prime favorite. It may seem absurd to mention it here, but I think that I have been enabled to manage these children more easily by not forcing them to acknowledge themselves to be frauds, but by passing rather rapidly over that phase of the question and asking them to try not to make more trouble for their parents than was necessary, and by assuring them that I would not betray their secret if they reformed.

I am aware that the accuracy of calling these cases hysterical may be questioned, and in the discussion which followed the reading of this note it was suggested that the trouble was more in the nature of a habit akin to that of biting the nails; but the rapid effect of the mental therapeutics employed contradicts this idea, and the line between pure meanness or a simple desire to excite sympathy on the one hand and well marked hysteria on the other is so hard to draw that I think it admissible, for brevity's sake, to call the cases hysterical.

CORNEAL ULCER FOLLOWING AN ADVANCEMENT OPERATION ON THE EXTERNAL RECTUS MUSCLE.

BY WARWICK M. COWGILL, PH. B. M. D.
PADUCAH, KY.

Emma B., æt. 19, of vigorous health, consulted me on March 14 in regard to having her eyes straightened. She had crossed strabismus of high degree alternating; vision $\frac{5}{20}$, or practically normal, in each eye, without glasses. Examination under hamatropine showed a low degree of hyperopic astigmatism right eye and a low degree of H. left eye (plus .50). The following day, with the assistance of Dr. Griffith, I did an advancement on the left external rectus and a tenotomy on the left internal rectus, using chloroform anæsthesia. A bichloride solution, 1-5,000, was used to cleanse the eye before the operation, and the same solution used in "sponging" and irrigating the eye during the operation. All the instruments and dressings were sterilized. Severe inaction followed the operation. Great chemosis developed, so that the œdematous conjunctiva rolled up over the edges of the cornea and became so great that the lids could not be closed over it. On the fourth day an ulcer of the cornea developed at the sclero-corneal junction, on the outer side. There was pain in the eye and some rise of temperature. There was no suppuration about the wounds.

As to the treatment, under cocaine anæsthesia I removed the stitches from the external rectus, fearing that they might be offending bodies, and cauterized the ulcer, after thoroughly cleansing it with pure carbolic acid. Hot applications were made to the eye for fifteen minutes in each hour, day and night. A solution of eserine (2 gr. to oz.) was instilled twice a day to soften the eye and permit as large a supply of blood to go toward nourishing the cornea as possible. The eye was cleansed frequently with a boric acid solution. The eserine instillation was kept up for five days, when the chemosis began to abate. Then I changed to the most vigorous use of atropine to combat the iritis that had developed. The ulcer was cauterized with pure carbolic acid on two occasions. The ulceration was superficial, but extended to the center of the cornea, and implicated about one-fifth of the corneal area. By the end of the second week the ulceration healed and the conjunctival inflammation abated. The result of the operation for correcting the strabismus is good. The only untoward effect is the large corneal leucoma.

This case, to me, has some interesting features. The unusual complications in an operation that heretofore had gone on so smoothly in my hands came to me like the shock at falling into a pitfall when one dreams himself most safe. Perhaps it is a good thing that we get halted occasionally, lest we become careless or give our patients too much assurance. My patient asked me the question the day she came to consult me in regard to doing the operation, "Doctor, is there any danger of my losing my eye from this operation?" I answered her that there was no danger of her losing her eye. I could readily see afterward that my answer was given without due consideration. It was based upon a general impression in my mind and my former experience in this operation, since in numerous cases in which I had done advancements I had met with none but the most satisfactory results. And I can testify that the assurance given the patient put me in an exceedingly uncomfortable position, for a few days I feared the cornea would be lost through strangulation. Why this intense reaction arose in this case I am unable to explain. As to the ulcer, there was no injury done to the cornea during the operation that I know of. It came, however, just where the severing of the conjunctiva and the pressure of the anchoring suture would tend to reduce the corneal nutrition. This, together with the intense chemosis, which, with its infiltration pressure, so interfered with the corneal nutrition that the ulcer was the result.

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HAS THE CORNEA NO FIXED DIOPTRIC VALUE?

BY CARL WEILAND, M. D.
PHILADELPHIA, PA.

In a former issue of the Ophthalmic Record Dr. William N. Sutter has written a very able article about the dioptric power of the cornea, in which he sets forth why on the ophthalmometer the scale is marked in dioptries. But in two points the writer begs to differ with him. Suppose, for example, that one mire was at 20 and the other at 23, whilst there was contact of the corneal images of the mires. We would then say that the refractive power of the cornea is 43 dioptries. Here Dr. Sutter asks: "Does this mean that the cornea whose radius is 7.8 millimeters (which corresponds to 43 D. on the

scale), is equivalent to a lens of 43 D., and might be replaced by such a lens?" He denies this and argues as follows:

"Refraction by a singe surface differs from that by a lens in that in the former the two principal focal lengths are unequal, the posterior being n times the anterior focal length. Rays proceeding from the anterior focus will be parallel after refraction, and for such rays the cornea might be replaced by a lens of 43 D., but rays which are parallel when they meet the cornea will after refraction meet in the posterior focus, distant $\frac{1}{3\frac{1}{2}}$ of a meter from the cornea; and for these rays the refractive power of the cornea is only 32 diopters. If the rays should proceed from some other point on the optic axis, the cornea would be equivalent neither to a lens of 43 D. nor to one of 32 D., but to a certain other lens which would have the same conjugate points as the cornea. In other words, the *cornea has no fixed dioptric value.* It could always be replaced by a certain lens, but by a different lens for every variation in the length of the incident pencil."

That we cannot replace the cornea by a certain fixed lens for all purposes is undoubtedly correct. But does this mean that the cornea has no fixed dioptric power? What do we call the dioptric power of a refracting surface? It is nothing but the dioptric power of a certain lens in air which under certain conditions will affect the incident rays of light in the same way as the refracting surface, and which, when given, will enable us to reconstruct the cornea. Tscherning in Javal's Memoires d'Ophtalmometrie (page 594) says that "if we want to compare the effect of the cornea with that of a lens placed in air, we ought to place this lens *in the center* of the cornea and give it a focal distance equal to the *anterior focal distance* of the cornea." That this is correct the reader will observe at once if he considers that a lens in air of such a focal distance $(\frac{1}{f} = \frac{n-1}{r})$ at that particular position will bring parallel rays of light to a focus at the same place as before and will also produce images of exactly the same size as the cornea did, as long as the distance of the object is so large that the length of the corneal radius may be neglected in comparison with it. We are therefore justified in comparing the refracting power of a cornea with such a lens. But one may look at this question from another standpoint. We may ask: What is the simplest way of defining the refractive condition of a surface? Now, if we cut off from the cornea with a sharp knife a thin plano convex lens, we may take this thin plano convex lens in air as a

measure. This thin lens in air would have a focal distance which can be found by the well known formula for a lens in air: $\frac{1}{f}=(n-1)\left(\frac{1}{r_1}+\frac{1}{r_2}\right)$ Here r2 is infinitely large and $n=1.3365$, that is the refractive index or cornea and aqueous. We see then that we obtain for the dioptric power of this corneal lens $\frac{1}{f}=\frac{n-1}{r_1}$ where r1 is the radius of the cornea. Now, the reciprocal of the focal distance of this lens may be taken as a measure for the refractive power of the cornea, and we may say in general that the dioptric power of a refracting surface is equal to that of a thin plano convex lens in air, obtained by cutting off a piece of that surface. This definition of the dioptric power of a refractive surface leads to the same result as that of Tscherning as far as the mathematical expression is concerned, which is $\frac{1}{f}=\frac{n-1}{r}$. This way of expressing the dioptric power of the cornea by the reciprocal of the *anterior* focal distance is very convenient.

This will be evident when we consider the question asked by Dr. Sutter: "Why do we, by subtracting the dioptric power (as recorded on the ophthalmometric scale) in the meridian of least refraction from that in the meridian of greatest refraction, obtain the dioptric equivalent of the lens which corrects the astigmatism?" The doctor answers:

"It is because, as the formulæ for refraction show, the dioptric power of the correcting lens is always equal to the difference between the reciprocals of the anterior focal lengths whatever be the length of the incident pencil. For instance, let us suppose an eye to be myopic 1 D. in the horizontal meridian and 2 D. in the vertical meridian. Since in the former meridian the far point of the eye, which is conjugate to the retina, is one meter distant from the eye, we have, by applying the formula for spherical refraction, the equation, $1+\frac{n}{f_1}=\frac{1}{F}$, f^1 being the distance of the retina from the cornea and F the anterior focal length of the cornea. In the vertical meridian, since the far point is ½ meter, we have the similar equation, $2+\frac{n}{f_1}=\frac{1}{F_1}$. Then $\frac{1}{F_1}-\frac{1}{F}=2-1$; or, $\frac{1}{F_1}-\frac{1}{F}$ is equal to the dioptric power of the lens which corrects the astigmatism.

"It is in this sense only that the markings on the scale represent the dioptric power of the cornea."

This answer, although the same as that given by Tscherning (loc.

cit. p. 594 in a note), is not quite conclusive, as it is correct only for an aphakic eye. For in the formula used by Dr. Sutter the point in front of the cornea and the point on the retina are regarded as conjugated points with reference to the cornea only. In an eye not aphakic f^1 must fall much behind the retina. This proof therefore cannot be accepted for an eye with a crystalline lens without further consideration.

But we may reason thus: In an emmetropic eye with a given crystalline lens, at a given distance both from retina and cornea, there can be only *one* point on the axis towards which rays, parallel in air, must converge after refraction by the cornea in order to be further refracted by the crystalline to a point on the retina. Let us call the distance of this point from the cornea F2, then F2 would be the second focal distance of an ideal cornea that would make this eye emmetropic. The first focal length of the cornea would then be $\frac{F_2}{n} = F$, and the refractive power of this ideal cornea would be $\frac{1}{F_1}$. But suppose we had not this, but another weaker cornea of the refractive power $\frac{1}{C_1}$, where therefore C1 would be the anterior and $nC_1 = C_2$ the posterior focal distance. This $\frac{1}{C_1}$ would be found by the ophthalmometer. What lens $\frac{1}{f}$ would we have to add to the cornea in order to make the eye emmetropic again? It is clear that this lens of focal distance f in contact with the cornea must have such a power that the parallel rays falling on it are by the cornea refracted to F2. For all rays refracted to F2 are by the crystalline focussed on the retina. Now the parallel rays, striking the lens, fall after refraction by the lens on the cornea converging towards a point f behind the cornea and we must therefore have by corneal refraction: $\frac{C_1}{-f} + \frac{C_2}{F_2} = 1$. But as $C_2 = nC_1$ and $F_2 = nF_1$ we have $\frac{C_1}{-f} + \frac{C_1}{F_1} = 1$, or $\frac{1}{f} = \frac{1}{F_1} - \frac{1}{C_1}$. That is, the refractive power of the lens is simply the difference between the dioptric power of the ideal cornea and that of the real cornea. Suppose, now, that in the other main meridian of the cornea we had the greater dioptric power $\frac{1}{K}$ and that f was the focal distance of the lens required to make this meridian emmetropic, then we would get also as before $\frac{1}{f_1} = \frac{1}{F_1} - \frac{1}{K_1}$. We would

therefore have by subtraction $\frac{1}{f} - \frac{1}{f_1} = \frac{1}{K_1} - \frac{1}{C_1}$ That is, the difference between the two correcting spheres or the cylinder would be equal to the difference between the dioptric powers of the two main meridians. Now, $\frac{1}{K_1}$ and $\frac{1}{C_1}$ are measured by the corneal images and are marked on the scale so that we see that this notation allows us to determine at once the cylinder which in contact with the cornea corrects the corneal astigmatism of the eye. This simplicity of the mathematical expression is another reason why the reciprocal of the anterior focal distance is taken as an expression for the dioptric power of the cornea. This same notation applied to the refractive power of a lens in air that is $\frac{1}{f} = (n-1)\left(\frac{1}{r_1} + \frac{1}{r_2}\right)$ or $\frac{1}{f} = \frac{n-1}{r_1} + \frac{n-1}{r_2}$ allows us to state that the refractive power of a lens is equal to the algebraic sum of the dioptric powers of its two surfaces.

TRAUMATIC LUXATION OF THE CRYSTALLINE LENS; SECONDARY GLAUCOMA; EXTRACTION WITHOUT LOSS OF VITREOUS; RECOVERY WITH NORMAL VISION.*

BY C. A. VEASEY, M. D.
PHILADELPHIA.
(ILLUSTRATED.)

The following case of traumatic luxation of the crystalline lens which came under the writer's observation while temporarily in charge of the ophthalmic wards of the Philadelphia Hospital seems to possess a number of unusual points of sufficient interest to justify its isolated report.

John C., an apparently healthy Italian, about fifty years of age, was admitted to the ophthalmic wards of the Philadelphia Hospital in the latter part of June, 1899, with the history of having been struck upon the left eye by the fist of an opponent five hours before admission. The resident, Dr. Sears, very intelligently noted that there was considerable abrasion and ecchymosis of the left upper lid and brow and that the pupil was oval vertically and about twice the diameter of its fellow. Within a couple of days the patient was seen by the writer and the following conditions observed:

* Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, November 20, 1900.

There were indications of slight bruising of both lids of the left eye, though the patient could open them freely. The eyeball was somewhat congested and this was especially marked in the ciliary region. Slight photophobia and considerable lachrymation were present, though the patient complained very little of pain. The pupil was almost vertically oval, about 9mm. in its longest diameter, and presenting through it into the anterior chamber in an almost vertical direction was the edge of the crystalline lens. This was so situated that the iris above and below, at the points of contact with the lens, as well as the anterior edge of the lens itself not covered by the iris, were apparently lying in contact with the posterior surface of the cornea. The lens had evidently made a quarter turn upon its vertical axis and now pointing almost straight forward, practically divided the anterior chamber into two halves. The cornea was a little hazy, especially in a line corresponding to the anterior edge of the lens, and the tension was moderately elevated.

Showing position of the lens in the anterior chamber.

A week later, notwithstanding rest in bed, bandaging of the eye and the instillation of a solution of eserine, the eye was more painful, the lens more opaque and the tension equaled +2. The eserine solution affected the pupil but little, and so far as could be perceived not at all where it was pressed upon by the lens.

It was now decided to make an effort to extract the lens, but the difficulty that confronted us was how to make the corneal section. The edge of the lens occupied such a position that it was impossible to pass a knife across the anterior chamber, either above or below, without piercing it, thus markedly increasing the difficulties of the section, even though such a procedure had been feasible, as well as increasing the chances of losing the lens in the vitreous.

Upon careful consideration the following plan was adopted: After the patient was placed profoundly under the influence of ether, a Bowman's needle was thrust through the cornea near the center of the

upper inner quadrant and entered into the dislocated lens sufficiently far from the anterior edge to retain a firm hold without tearing loose. Using the cornea as a fulcrum the handle of the needle was now brought forward and upward and held in this position by an assistant, thus depressing the lens directly downward and backward into the pupillary space (care being exercised not to permit it to slip from the needle) until sufficient room had been cleared to allow the making of a downward section. The section was then made with a narrow Graefe knife, and while a second assistant kept the lips of the speculum elevated from the eyeball a wire loop was introduced beside the lens, when, by a combined movement of the transfixing needle at the time of its withdrawal and a quarter turn of the loop, the lens was made to lie flatwise and delivered, without the loss of any vitreous.

The early healing of the wound was quite kind, there being but little irritation and the pupil round. On the eighth day, however, there developed a small linear slough at the site of the corneal wound which persisted as an ulcer for many weeks, producing some ciliary injection and a slight indentation in the otherwise round pupil. The diplococcus of Fraenkel was the only micro-organism ever found in the ulcer, and the only way in which the infection could be accounted for was the presence in the ward during convalescence of some cases of pneumococcus conjunctivitis.

The ultimate vision of the eye was exceedingly good, however, for an examination made a few days since showed that with +9.D spherical —1.D cylinder axis 15 degrees — could be readily seen, and with —s3.D added Jaeger 1 was easily read.

Dr. R. Parks White, one of the oculists and aurists of the Pennsylvania Railroad, is making trips over the system in locomotive cabs for the purpose of investigating defects of sight and hearing on the part of the trainmen and investigating the reasons therefor.

The Illinois State Board of Health has officially indorsed the Eye and Ear Tests for School Children devised by Dr. Allport, and recommended their adoption in the various schools throughout the State.

ABSTRACTS

FROM RECENT OPHTHALMIC LITERATURE.

BY G. E .DE SCHWEINITZ, M. D., AND C. A. VEASEY, M. D.

A Contribution to the Diagnosis and Treatment of Magnetic Intraocular Foreign Bodies.—Henri Coppez and Isador Gunsburg (*Archives d'Ophtalmologie,* September, 1900) give the notes of a number of cases of foreign bodies situated in various portions of the eye which have come for treatment in the clinic of Professor Coppez in Brussels. According to these authors, it is important to separate sharply foreign bodies situated in the anterior portion of the globe from those in the posterior portion, inasmuch as the symptoms, prognosis and treatment greatly vary.

They encountered eight foreign bodies in the anterior part of the globe, two being situated immediately behind the iris, five in the crystalline lens and one posterior to the crystalline lens. They call attention particularly to the greenish hue which a traumatic cataract presents when it is caused by an imbedded metallic body.

Twenty-eight cases of foreign body situated in the posterior part of the globe are analyzed, the treatment resulting once in a visual acuity of 2-3, twice in good light perception, five times in conservation of the eye, seven times in enucleation after unsuccessful attempted extraction, once in enucleation for sympathetic ophthalmia after extraction, and twelve times in enucleation without attempted extraction. They call attention to the much more unfavorable prognosis of foreign bodies situated in the posterior portion of the globe as compared with those situated anteriorly. Again, the prognosis varies very much, depending upon what portion of the posterior part of the globe the foreign body is imbedded in. For example, it is much more favorable for foreign bodies situated in the vitreous body than for those in the ciliary body or the choroid. In the last named situation the foreign substance rapidly contracts so solid an adherence with the neighboring tissues that the electro-magnet cannot displace it even if it is in contact with the body itself after the eyeball is enucleated and opened. For diagnostic purposes they place the greatest reliance upon the magnetometer of Gerard, which they employed twenty-seven times

with the greatest satisfaction. They have in some cases introduced the electro-magnet through the original wound, enlarged as needed, also into the anterior chamber, and also into the vitreous space, according to the method of Hirschberg. Six times they observed sympathetic ophthalmia following the introduction of foreign bodies within the eye. The weight of the foreign bodies extracted or removed after enucleation varied from 1 milligramme to 1,050 milligrammes. They divide these bodies according to their weight, as follows: Light bodies, 1-60 milligrammes, 24 in number; medium-weight bodies, 102-265 milligrammes, 4 in number; heavy bodies, 273-1,050 milligrammes, 4 in number. They summarize their thirty-five cases as follows: (1) Preservation of vision from 2-3 to simple light perception remediable by later operation, 10 cases, that is 29 per cent; (2) conservation of the eye without vision, 5 cases, that is 14 per cent; (3) enucleation, 20 cases, that is 57 per cent. If the surgeon does not possess the magnetometer of Gerard or the sideroscope of Asmus, the authors consider the diagnosis difficult and often impossible, and while they have due regard for the general clinical symptoms of foreign bodies retained within the eye, they think that all of them put together have not the value of a single oscillation of the magnetic needle.

(Radiography is mentioned in connection with several of the cases, but without special comment except to say that in one instance the radiograph failed to show the foreign body which was afterwards localized with the magnetometer. It seems strange that the great value of localization by means of the X-rays, when employed according to the method of Sweet or Mackenzie Davidson, should not have found greater favor upon the Continent. Certainly no localizing method could be more exact.—G. E. DE S.)

The Treatment of Injuries of the Ocular Globe.—Terrien (abstract from the *Presse Medicale, in the Archives d'Ophtalmologie*, September, 1900) believes that if a wound of the cornea is central, with or without prolapse of the iris, a collyrium of atropine, 1 or 2 per cent, should be instilled in order to keep the pupil dilated or to disengage the pupillary border if it is incarcerated in the wound, but that this employment of a mydriatic should be carefully watched lest it elevate the intraocular tension. If the wound is peripheral and there is prolapse of the iris, an attempt to reduce the pro-

lapse may be made if the surgeon is called early, or several drops of the following collyrium may be instilled for a few days:

Nitrate of pilocarpine . . . . . 0.10 centigram
Salicylate of eserine . . . . . 0.03 centigram
Distilled water . . . . . 10 grammes

In the event of failure the prolapse should be excised. If the crystalline lens itself is involved and increased intraocular tension from swelling of the lens takes place, extraction of the opaque crystalline body should be undertaken. In all of these cases, in addition to the measures already advised, an antiseptic collyrium is advantageous. For this purpose the following is recommended:

Biniodide of mercury . . . . . 0.05 centigram
Ninety per cent alcohol. . . . . 16 grammes
Water . . . . . 1,000 grammes

The treatment of wounds of the sclerotic depends upon whether the conjunctiva is divided over the incised sclerotic, or whether the rupture is subconjunctival. Under the latter circumstances antiseptic bandaging and rest are all that are required, beause the conjunctiva protects the wound from the entrance of septic germs. When the wound is "compound," that is to say, the conjunctiva as well as the sclera is divided, after thoroughly cleansing the lips of the wound the conjunctiva should be sutured above it. The treatment of more extensive wounds when all the coats of the eye are divided does not differ from that already enunciated, great care being necessary to cleanse the lips of the wound and to insert sutures as early as possible so as to prevent infection of the vitreous chamber. When the wound is situated in the corneo-scleral junction the same rules of surgery apply, with the understanding that an injury in this region is more apt to produce sympathetic ophthalmia than one placed elsewhere, and if conservative surgical methods are employed, it is absolutely important to keep the patient under observation until this danger has passed away. If infection occurs, or if there are any signs of sympathetic involvement upon the other side, then enucleation is demanded. Grave traumatisms of the ocular globe, followed by great loss of the vitreous and prolapse of the ocular coats necessarily would sometimes require immediate enucleation or an operation of equivalent character, but not always, because the author believes that the atrophic stump will often be found superior to any one that could be made by enucleation.

These rules are in accord with those generally followed by ophthalmic surgeons. There is some reason to believe, however, as Knapp pointed out some years ago, that it is not always best to excise a prolapse of the iris if it is seen at a period so long after the accident that it is unlikely that the edges of the wound can be freed from the adherent iris. Under expectant treatment such prolapses not infrequently subside and leave flat, quiet scars. Each case, however, must be judged on its own merits, and generally operative procedure gives the best results. When there is much loss of vitreous after a wound of the eye and an attempt is made to save the globe, before the sutures are applied, the globe should be distended with tepid sterilized physiological salt solution.—G. E. DE S.)

The Hot-Air Douche and Its Use in Diseases of the Eye.—Wolffberg (*Wochenschrift fur Therapie und Hygiene des Auges,* October 18, 1900) describes an apparatus for making continuous applications of hot air to the eye which consists of a tube extending through a compartment of sheet iron, the latter being heated by four Bunsen burners. As the tube emerges from one end of the compartment it becomes freely mobile and is provided with a funnel-shaped cup. At the other end there is a ventilator propelled by electricity which continually carries in fresh air to replace in a uniform manner the warmed air in the tube, thus permitting a continuous stream of hot air to emerge from the cup-shaped end for therapeutic purposes. For regulating the degree of temperature a thermometer is attached, and it is easy, by extinguishing one or more of the Bunsen burners after the temperature has reached 120 deg. F., to maintain a constant degree of about 100. At a distance of about 5 cm. from the mouthpiece the temperature is about 80 deg.

The effect of the application of this continuous dry heat to a healthy eye is to produce slight ptosis and mild blepharospasm, both of which remain during the time of the experiment (up to ten minutes). The skin of the lid and surrounding parts is at first pale, but soon becomes intensely red, and remains so for some hours after the douche has been removed. Lachrymation occurs at first, but diminishes as the application is continued. The bulbar conjunctiva shows a moderate, uniform injection and the cornea becomes more shiny The pupil at first becomes more dilated and then contracts. So far as could be determined, accommodation and tension remain unchanged.

Excellent results are claimed in iritis, kerato-iritis, blepharitis and supra-orbital neuralgia. The proximity of the douche to the eye was left to the selection of the patients, though most of them placed the eyes as near as 8 cm. The duration of the application varied from fifteen minutes to an hour.

Three New Cases of Keratitis Aspergillina.—Gentilini (*Beitrage zur Augenheilkunde,* part 45, 1900) adds the histories of three new cases of this disease to the seven previously recorded and gives the following clinical picture. There is usually a history of injury with infection. Soon the ulcer presents a characteristic dry appearance notwithstanding the great amount of lachrymation. It looks not unlike a greased spot over which the tears flow without producing any moisture beneath. A crust appears on its surface elevated above the edge of the surrounding cornea, the latter becoming markedly infiltrated. This corneal opacity, however, does not extend to the edge of the ulcer, but stops about 1 mm. distant, leaving the latter surrounded by a ring of clear cornea. There is no formation of a large slough, the crust being composed of numerous small particles, thus producing a crumby appearance. Hypopyon and congestion of the iris are usually present.

As to the etiology, it can be inferred that either injury and infection occur simultaneously, or a previously existing wound in some manner becomes infected with the fungus.

An examination of the crust of the ulcer in a fresh state by the loupe showed it to possess a crumby appearance, composed of numerous button-shaped masses lying in juxtaposition, some confluent, about one-half millimeter in diameter, the periphery of each mass showing a radiating structure. The tissue between these masses had a punctate and triate appearance. The microscopical examination showed that a the margin of the preparation the corneal epithelium was still visible but was not normal. The most superficial layers lacked nuclei and the middle layers were irregularly arranged, as the basilar cells were so swollen as to be recognized with difficulty. Bowman's membrane was found in good condition, though it disappeared in the neighborhood of the ulcer, but reappeared for a short distance near its center. At the place where Bowman's membrane terminated it was penetrated by wedge-shaped mycelium threads, dividing the former into two layers. In the fungus beneath Bowman's membrane the corneal tissue

is thickly occupied by mycelium threads. This infiltration continues to the most superficial layers of the parenchyma and is noted principally toward the periphery of the ulcer. In those areas in which the threads seem to extend to the periphery a general branching is noted, the fungi more closely approaching Bowman's membrane, and when this membrane terminates some penetrate it and where it is absent some lie free on the surface. They also penetrate deepest near the center of the ulcer. The most superficial layers of the fungous mass appear spongy and the threads are narrower, containing numerous dark-blue granules and rod-like formations. In the deepest portion of the parenchyma the threads are better preserved and appear more homogeneous and swollen, but are less numerous than on the surface and contain no granules. On account of the absence of the latter they are supposed to be younger than those at the surface, which have degenerated. Cultures by the usual methods showed the aspergillus fumigatus in a pure state.

The treatment of the condition is excision of the fungous mass with cauterization, the use of atropin, the bandage and hot fementations.

Discission of the Anterior Lens Capsule. — Blumenthal (*Beitrage zur Augenheilkunde,* part 45, 1900) describes the following method of discission which he has practised for some time with satisfactory results. The pupil having been fully dilated with atropine, the operator places himself behind the head of the patient for both eyes and seizes the bulb immediately below the continued vertical meridian of the cornea, the patient looking down and in, if the operation be upon the right eye, and down and out, if upon the left. The puncture in the right eye is made in the upper outer quadrant and in the left eye in the upper inner quadrant. The point of entrance is variable, but should be from one to two millimeters within the margin of the dilated pupil. In rare cases, as in elderly myopes of high degree, when the pupil does not dilate readily the puncture should be made in a point corresponding to the margin of the pupil. A Bowman's needle is employed and is introduced almost vertically into the cornea so that one of its small lance shaped surfaces is directed toward the front. As soon as the cornea is penetrated the handle is depressed and the point of the needle pushed forward obliquely to the anterior surface of the lens capsule, down and in for the right eye and down and out for the left eye. When a point about two

millimeters from the opposite pupillary margin is reached the needle is turned so that the edge of the lance is directed forward, and the point thrust into the capsule. The cornea then being employed as a fulcrum the needle is slightly withdrawn as it makes a cut across the lens to a position directly beneath the point of entrance. The needle is again pushed into the anterior chamber parallel to the surface of the lens and a curved cut made in the capsule in the neighborhood of the opposite pupillary margin. It is next pushed almost directly downward to the lower pupillary margin and another oblique cut made, after which a second curve opposite to the first completes the operation. After the needle is withdrawn the aqueous is permitted to escape, and if the latter does not occur at once it is encouraged to do so by gentle pressure. A pad of cotton saturated with a solution of boric acid is placed over the eye and on this a lump of ice, which is replaced later by a bandage and an ice bag. The author believes that in secondary glaucoma or when the lens absorbs too slowly that repeated paracentesis of the anterior chamber will bring about the desired result and that only in cases of the greatest necessity should linear extraction be employed.

ABSTRACT.

Orthoptic Treatment of Convergent Squint in Young Children.

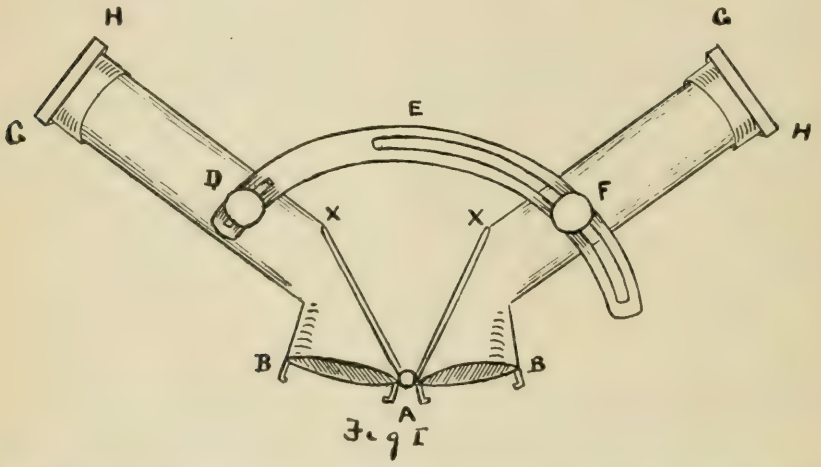
By Mr. C. Worth (read before Ophthalmological Society of United Kingdom, October 19, 1900). The treatment adopted by most surgeons in cases of convergent squint is as follows: Glasses are ordered to be worn constantly. In nearly 30 per cent of constant monolateral squint the eyes after a time become "straight" and remain so while glasses are worn. Some of these acquire binocular vision and are really cured. The majority are not. In the 70 per cent which are not "cured" by glasses alone the patients are usually left without further treatment till the age of 7 or 8 yars, when most of them are operated upon. But only a very small proportion will then ever get binocular vision. The time has gone by when this might have been easily established in suitable cases. There are three difficulties in the way of orthoptic treatment of squint in young children:

1. The child will only submit to treatment so long as he finds it interesting.

2. The suppression of the vision of the squinting eye.

3. The angle of the squint is usually so great that an ordinary stereoscope could not be used even if there were no suppression.

In 1895 Mr. Worth made the instrument shown in the drawing with the object of overcoming these difficulties. The instrument consists of two halves joined by a hinge at A. Each half consists of a very short tube joined to a longer tube at an angle of 120 degrees. At AX is an oval mirror. At G H, in each tube, is placed a glass picture-slide. At A B is a lens whose focal length equals the distance of



the reflected image of G H. In addition to these lenses, there are slots at A B into which lenses from the trial case may be put to correct the refractive error of the patient. D E F is a brass arc with two slots in it—a short slot in which is the binding screw D and a long slot in which is the screw F. When the screw F is loosened the two halves of the instrument may be brought together to suit a convergence of the visual axes up to 60 degrees or separated to suit a divergence of as much as 30 degrees. When the screw F is tightened and D is loosened an amplitude of movement of about 10 degrees only is permitted.

He finds that those who see binocularly naturally arrange themselves into three separate and distinct classes according to the degree in which they possess this faculty. These grades of binocular vision may be called:

First grade—Simultaneous macular perception.

Second grade—True fusion with some amplitude.
Third grade—Sense of perspection.

Fig. 2.

Before beginning treatment he ascertains the visual acuity of the child's squinting eye by means of a series of little ivory balls.

The instrument is then adjusted to suit the angle and direction of the squint and a cage, for instance, Fig. 2, is shown before the fixing

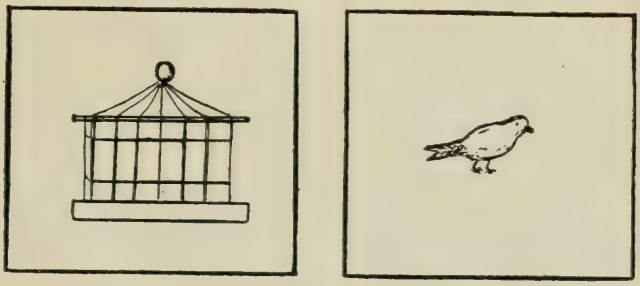


Fig. 3.

eye and a bird before the squinting eye. The child sees only with the fixing eye. Illumination of the slide before the squinting eye is increased and that of the slide before the fixing eye diminished till the child sees the bird he was told to look for. He has now usually lost sight of the cage. Illuminations are then readjusted till the child sees the bird in the cage. Many similar designs are then shown. Then he is shown a series of slides which require blending of the images. Figs. 3 and 4. He soon learns to do this (grade 1).

After a time it is found that the angle of the instrument may be altered very slightly without the fused picture coming to pieces, the eye follows the objects and maintains fusion (grade 2).

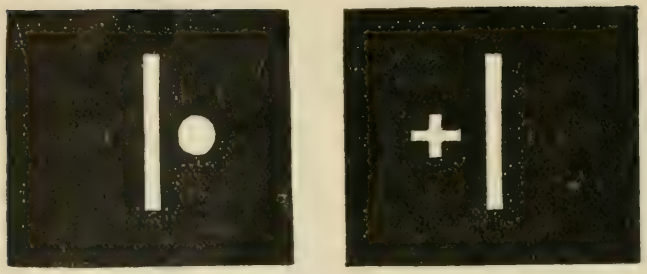


Fig. 4.

Exercises are continued with slides such as Figs. 5 and 6 till the tests show that grade 3 has been reached.

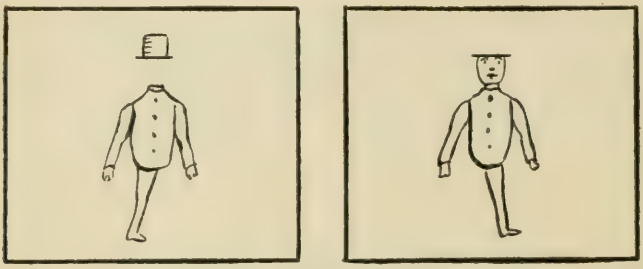


Fig. 5.

The next thing is to gradually equalize the illumination of the object slides. This may be done at this stage without a return of the suppression. Next an attempt is made to separate the mirrors more and more while the visual axes follow the direction of the objects.

Mr. Worth has used this treatment in some hundreds of cases and,

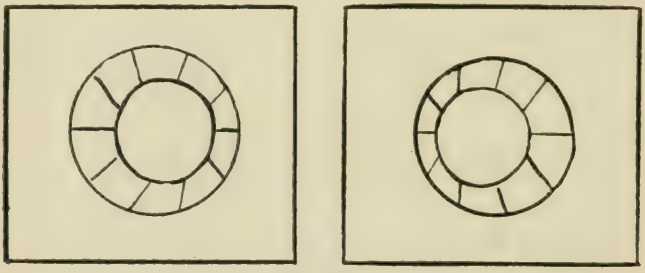


Fig. 6.

in a considerable proportion, exercises and the use of glasses have caused a disappearance of the squint and the acquisition of the highest grade of binocular vision.

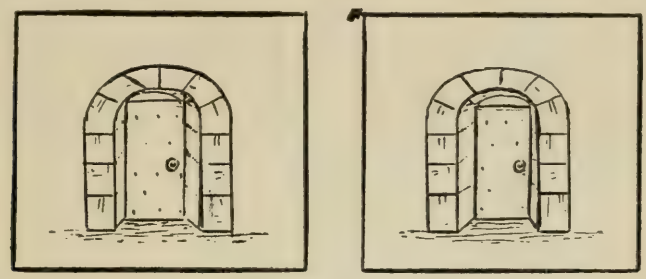


Fig. 7.

In other cases, though patients have grade 3 while looking into the instrument, the squint does not disappear. An occasional visit is quite sufficient to preserve the fusion faculty till an appropriate age for oper-

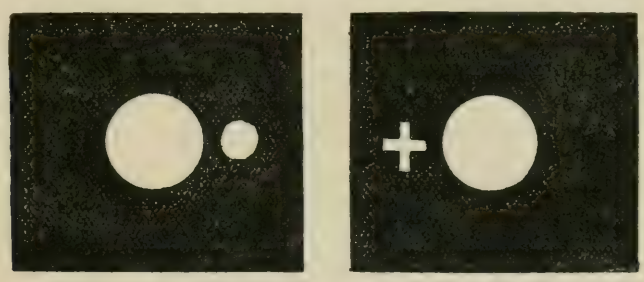


Fig. 8.

ation has been reached. The desire for fusion then overcomes any slight defect that may remain and a perfect cure results.

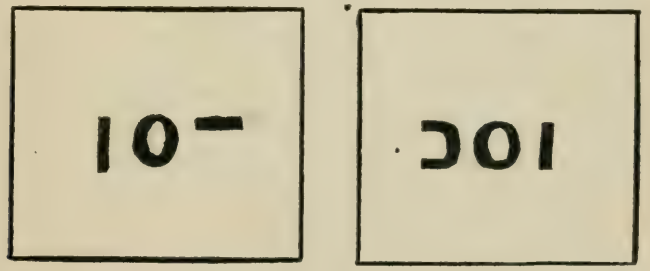


Fig. 9.

This treatment, of course, fails in those cases in which the deviating eye is too blind, and in those in which there is a congenital absence of the potential faculty of fusion.

The special points of this instrument are: 1. Its adaptability to a squint of any degree or direction, including those cases in which the globe is rotated about an antero-posterior axis. 2. Suppression of vision of the squinting eye is quickly overcome by unequal illumination. 3. The variety of devices shown in the instrument interests and amuses the child so that he will readily give one all the help he can.

A City Hall and Basement School.—Major Farley is right when he says that no money should be spent upon a new city hall for Cleveland so long as one child remains in a basement school. The educational, utilitarian and æsthetic value of fine buildings in a city is not to be questioned; but it sinks into unimportance when compared with the city's crime in forcing a large number of its children to attend school in poorly lighted and worse ventilated basements. We hope the committee of the Cleveland Medical Society appointed to study the school question will be able to suggest practical ways and means for permanently and radically improving the unhygienic conditions under which our school children are condemned to work. It has been said that the basement schoolroom is even at its worse a more hygienic place than the houses from which many of the children come who occupy it, but really this is an additional reason for improving the school conditions. This question of basement schools has much to do with the sobriety, industry and health of the coming generations, and in comparison five or ten years' delay in securing a magnificent city hall is a mere bagatelle.—*Cleveland Medical Journal.*

Dr. Mitvalsky, of Prague, is dead. He was well known mainly through his studies upon intraocular tumors (cysts of the orbit, choroidal sarcome, sinus osteoma, metastic ophthalmitis, and thrombophlebitis).

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME X. CHICAGO, JANUARY, 1901. No. 1. NEW SERIES.

EDITORIALS.

THE VERACITY OF THE JAVAL-SCHIÖTZ OPHTHALMOMETER.

In the November issue of this journal a correspondent takes exception to that portion of an editorial in the August number relating to the Javal-Schiötz ophthalmometer, resenting the accusation that it is mendacious and deceptive, and hints that the fault lies with the writer of the editorial and not with the instrument, the working of which, he asserts, "when properly constructed, is as unalterable as the laws of light on which it depends," it doing "all that its originators claimed it would do, and in this respect it speaks the truth, the whole truth, and nothing but the truth." By this it is presumed he means a keratometer.

Now, the writer of the editorial gives place to no one in admiration and respect for the men who made keratometry a clinical possibility, and he bears in grateful remembrance the kindness of Javal, who tested for him his ophthalmometer in his ophthalmological laboratory at the Sorbonne and also gave him personal advice as to its use. In the twelve years since, the writer has made hundreds of careful examinations with it and compared the results with the final results of other methods and he has come to mistrust it not only because of the discrepancy between its findings and the subjective astigmatism of the eye, but because of its shortcomings within its proper sphere as a *keratometer.*

In his daily refraction work he has come with others to realize, chiefly through painstaking skiascopy, the great practical importance of estimating the refraction in the so-called visual zone of the pupil, i. e., in and close to the visual line, of noting the angle alpha, and especially that portion of the anterior surface of the cornea through which the line of vision passes. Collectively skiascopy, keratometry and subjective tests have led him to suspect more and more that the pupillary area of the cornea which is commonly supposed to be generally either fairly spherical or to present a regular astigmatic curvature, is the principal seat of the discrepancy between the findings of the Javal instrument and the trial case, instead of the crystalline lens. It naturally occurred to him that as the reflections on the cornea of the mires (as seen without the telescope) travel in a circle around the line of vision which has a diameter of 3 mm., that by pushing the mires in close to the telescope a smaller arc of surface would be measured. But this is a fallacy, as the images seen through the telescope are then simply reversed in position, and when contact is made of the adjacent edges of the doubled images, these now correspond to the peripheral edges of the corneal images which are again found to be 3 mm. apart. It is therefore impossible to measure an arc of less than 3 mm.; we may, however, cause the patient to fix points 5, 10 and 20 degrees away from the axis of the instrument and thus measure arcs of 3 mm. along the meridians. This was one of the purposes of the large disc Javal added to the model of 1889; but while one image can thus be brought close to the visual line the other is proportionately moved away from it.

But why, it may be asked, is it so important to measure the cornea at the visual line? In the pupillary space is not the curvature in each meridian a uniform one for the regular astigmatism we so often measure?

In answering this question particular weight must be given to the evidence of Tscherning, co-worker with Javal, and adjunct director of the Sorbonne laboratory whence the ophthalmometer emanated and where Tscherning distinguished himself by his well-known researches on the dioptric surfaces of the eye. In his "Physiologic Optics," after citing as small factors of supplementary astigmatism (by which he means the difference between keratometric and subjective astigmatism), the lenticular astigmatism, the obliquity of the lens, and the distance of the correcting lens from the eye, and noting that from numbers of eyes

which he has examined in which the astigmatism of the posterior surface of the cornea is against the rule, there is reason to believe that it is general, he says (p. 128): "Among the factors which play a part in supplementary astigmatism, the most important is probably the variation of the astigmatism in the different zones of the cornea. The peripheral zones frequently present a value, and sometimes directions more or less different from those of the central zones. This, among other things, follows from the measurements of the peripheral parts of the cornea by Sulzer, but it is especially after I began to work with the optometer of Young that I frequently found considerable differences between the refraction of different parts of the pupillary space, and that I became convinced of the importance of these differences. There certainly exist some regularly constructed eyes in which the astigmatism is nearly the same in the whole pupillary space, but most eyes are more or less irregular. Entirely regular astigmatism is only imaginary."

It is not easy to imagine how seemingly slight irregularities of curvature can signify much, but when we consider that a difference of ½ mm. in the corneal radius corresponds to about 3 dioptres, it is not difficult to realize their importance. Tscherning states (p. 137) that these differences in the pupillary space may reach several dioptres, and a diagram of one of the cornea measured by Sulzer is given in Norris and Oliver's work, vol. ii, p. 133, which when analyzed shows a notable difference between the central astigmatism and that 10 degrees from the visual line, 1 mm. on the corneal surface corresponding to 7¼ degrees.

Dr. Chas. A. Oliver (Norris and Oliver, vol. iv, p. 458), referring to the ophthalmometer, says: "The fact that the main purpose of the method in ophthalmic practice is to expose the meridional faults that are resident in the anterior surface of the cornea alone, proves that it is faulty even as a keratometer—it failing to take any note of the posterior surface of the membrane as well as of any irregularities that may exist in the corneal tissue itself." Further on he says: "Practically, then, the newest and most improved American models of the keratometer of Javal-Schiötz, or the better constructed instrument of Leroy and Dubois, and that of Reid—which last should always be preferred—are most useful, when carefully applied, in determining approx-

imately the angles of the axes and the degrees of the various meridians of corneal astigmatism."

It will be noticed that Oliver gives the preference to the keratometer of Reid, as have other competent observers who have tested it and compared it with the Javal-Schiötz instrument. The Reid instrument, which is but a few inches long, has been compared by Lucciola with those of Helmholtz, Javal-Schiötz and Leroy-Dubois. He states that it measures the corneal astigmatism at the visual line, and that any marked decentration of the cornea is readily detected, and he gives it the preference. It is to be regretted that American instrument makers have not taken it up, as, besides its portability, its price is comparatively moderate. An instrument closely following the principles of its construction is now sold in New York which is called Dr. Aiken's Astigmoscope.

In conclusion the writer disavows any intention of depreciating the merits of the Javal-Schiötz instrument, which has rendered him valuable service. It would be absurd to disregard its virtues because of its faults, and one of its virtues is its record of the axis of the astigmatism. All things in this world are relative. To him who has become skilled in the finer points of skiascopy and subjective tests, the ophthalmometer will have a less value than to him who has not. At all events it will hardly enhance its reputation to advance such claims for it as have been made by the correspondent. E. B. EATON.

Dr. Ensigne Lopez is President of the Ophthalmological Section of the Pan-American Medical Congress to be held at Havana Feb. 4.

The new staff of St. Vincent's Infirmary of Indianapolis has been appointed. The eye and ear portion of the staff is as follows: J. L. Thompson, F. A. Morrison, D. A. Thompson and J. J. Kyle.

The death of Prof. Dohnberg, of St. Petersburg, occurred June 20, 1900. Dr. Dohnberg's death was due to an injury inflicted by an officer, in revenge for a private injury. Dohnberg was 48 years old.

Dr. Charles Zimmermann, of Milwaukee, has been appointed on the staff of the *Annals of Ophthalmology*. He will be associated with Dr. R. L. Randolph in the department of German ophthalmic literature.

CORRESPONDENCE.

MEYROWITZ AT THE PARIS EXPOSITION.

CHICAGO, November 24, 1900.

Editors of the OPHTHALMIC RECORD.

DEAR SIRS: My attention has just been called to a bit of correspondence from E. B. Meyrowitz, of New York, published in the November number of your journal, in which that gentleman, alluding to a letter I wrote from Paris last summer, intimates that I stated that he had no exhibit at the late International Exposition.

If Mr. Meyrowitz will read my letter more carefully he will perceive his own error. I was well aware of the fact that he showed articles there; they were not, however, among those belonging to medicine and surgery. The Haab magnet and the electrical tapping appliance to which he refers were exhibited, the one in Group V, Class 27, and the other in Group V, Class 25. Medicine and surgery constituted Class 16 of Group III, and the letter in question relates only to objects to be found in that class. So far, indeed, were my words from implying aught to the discredit of Mr. Meyrowitz that they actually contain a deservedly high compliment to the excellence of his manufactures. I quote them: "It is much to be regretted that the United States did not send specimens of the products of a greater number of her leading houses who understand so thoroughly the art of making things *coming under this class.*"

Sincerely yours,

CHARLES H. BEARD.

Dr. Robert R. Hampton, recently interne at the Illinois Eye and Ear Infirmary and now settled in Mexico, was married last December to Miss Margaret E. Howat, of Salt Lake City.

One of the best little books for students that we have seen for some time has just appeared and is called "A Manual of Diseases of the Eye," by Dr. Charles H. May, of New York. It is also an excellent book for quick reference for the general practitioner. It contains a great deal of accurate and concise information, and is generally a model of its kind. It contains 243 original illustrations, including 12 colored figures. It contains 406 pages, and is excellently indexed. It is small and easily handled and can easily be placed in an ordinary coat pocket. It is published by William Wood & Co.

REVIEW.

ALTERATIONS IN THE CORNEAL CURVES FOLLOWING STRABISMUS OPERATIONS.*

BY DR. PARIDE MELLONI, OF MILAN, ITALY.

A Review by

DR. CASEY A. WOOD,

of Chicago.

Dr. Melloni believes that the subject of form-changes in the cornea owes its peculiar interest for the investigator to the numerous and important observations of these alterations by Helmholtz and Javal. The special significance not only of the transparency but also of the shape of this delicate membrane, considered as a refracting medium, explains the reasons for these researches. We have learned the typical shape of the cornea and the various aberrations from this type. We have also learned how the cornea may vary in its curvature under certain circumstances and the various conditions and causes which determine these variations in individual cases. Among the studies that have been made might be mentioned those on glaucomatous eyes and on eyes after operations for cataract, iridectomy or paracentesis. The peculiar arrangement of the organ of sight in respect to its mobility and the relations between the eyeball and the muscles to which it owes its mobility, suggested long ago the idea that the muscles might have some connection with the shape of the cornea and that it might be modified by variations in these relations. In fact, if we consider the eyeball, we see that it is a spheroid suspended in the cavity of the orbit, moved by two groups of muscles, the recti and the obliques —that these two antagonistic forces, counteracting each, should make their action felt on the eyeball itself, seems very reasonable. The oblique muscles embrace it in a muscular sheath and it is further suspended by four strong muscles inserted symmetrically around the ball on the anterior half. Tenon's capsule effectively supplements the lesser power of the obliques. The eyeball compressed between these two forces would be crushed if it were not for its internal tension. When we reflect that the sclerotic is a tough, unyielding, fibrous envelope we see that if any effect of this pressure is at all felt by the eye-

*Modificazione delle curve corneali in segnito alli operanzione di strabismo.—Annali d Ottalmolgia, p. 408–432, 1900.

ball, it will chiefly affect the cornea. If, besides, we note that the attachment of one of these forces, the recti, is extremely close to the cornea, the conception that the muscles can exert some influence on its shape becomes highly reasonable. We must certainly admit some effect from these forces, although we are far from accepting the exaggerated action attributed to them by the ancients who explained the phenomena of accommodation by the variations induced in the shape and depth of the eye by the action of the extrinsic muscles. It remains to be seen whether the internal tension of the eyeball and the resistance of the cornea are so superior to the force that can be exerted by the muscles, that the action of the latter, whether considered as compression or traction, can be regarded as insignificant.

We remarked that any pressure on the eyeball would be felt chiefly by the cornea. This is in conformance to the physical laws regulating pressure in all directions from a given force. If any part of the globe yields, it will certainly be the thinnest and most elastic portion. That it does not require much force to alter the shape of the cornea is a matter of daily experience. Georges Martin, whose investigations of this subject are of such importance, believes that the radii of curvature of the cornea may be altered even by a slight force, such as the contraction of the ciliary muscle. Speaking of corneal astigmatism he notes that Javal, Bull and Chibret have also observed an increase or decrease in its amount, thus establishing the fact that it is not a stable phenomenon. He denies that in some instances at least the motor ocular muscles are concerned in this variation, and attributes the cause to the contraction of the fibrils of the ciliary muscles communicated to the cornea by the tendons of this muscle, which are continuous with the fibers of Descemet's membrane. He also mentions some fairly successful corroborative experiments on animals with irritation of the ciliary muscle, localized at two opposite points. Reuss and Stocker confirmed this view by their researches, showing that eserin and pilocarpin are able to shorten the radius of curvature of the cornea while the spasm of accommodation lasts. The works of Lacqeur, Rowe, Bull, Swan Burnett and Weiss have demonstrated that even the pressure of the lids produces astigmatism, and that the changes in the cornea with advancing age are partially due to this cause. Pflüger has also found that the frequency of ordinary astigmatism diminishes with age, while that of astigmatism against

the rule increases, a fact recently confirmed by Pfalz with numerous statistic data. The possibility therefore, of changes in the shape of the cornea from slight causes may be regarded as fully established.

The author now proceeds to the discussion of the question proper—whether alterations in the length or position of the muscles with relation to the globe are capable of altering the corneal curvature. Leroy was among the first to call attention to the influence of the muscles on the shape of the cornea, observing how the greater and lesser curves correspond perfectly with the arrangement of the different muscular forces disposed around it. The minimal flattening is on the temporal side, i. e., it corresponds to the external, the weakest, rectus, the maximal on the nasal side, corresponding to the internal rectus, strongest of the extrinsic muscles of the eye. The curvature above and below is practically the same, corresponding to the superior and inferior recti which are of equal strength. Roeder admits a slight amount of corneal astigmatism produced by the extrinsic muscles of the eye. Schneller speaks of changes in the shape of the eye under the influence of muscular contractions. The ocular muscles, according to him, especially in individuals with an elastic sclerotic, may by their contraction shorten the eyeball across, lengthening it in the antero-posterior diameter, which would explain to a certain extent accommodation in the absence of the crystalline lens, a condition found by Förster to be greater in the young. The conclusions of his experiments are that strong convergence lengthens the radius of curvature of the cornea. These assertions of Schneller's have been combatted by Sattler, it is true, but if these changes are open to doubt, or at least are slight and scarcely appreciable in ordinary cases and in normal eyes, the same can not be said of the changes which occur under the influence of muscular contractions when the internal tension has been even slightly diminished, as has been demonstrated by Baiardi's research on eyes after paracentesis. On the other hand we have Stilling's theory of the genesis of myopia and of the important part played by the contractions of the superior oblique in its evolution.

Referring to the pathogenesis of myopia it does not seem out of place here to cite Motais' opinion in regard to the muscle theory as far as the compression of the eyeball by the muscles is concerned. According to this author it is not correct to say that the muscle in

contracting compresses the eye toward the equator, shortening the curve that it makes in embracing the globe itself, as at first sight would seem must be the case. Compression of this nature is in reality impossible, according to him. "I have in fact established," he states, "that the capsule exerts an eccentric traction on the muscle as soon as it begins to act, the energy of the traction increasing proportionately to that of the muscular contraction. The antagonist on the contrary, actually rolls up on the eyeball. I can present positive proof that the disposition of the capsular process here becomes the reverse; it relaxes instead of stretching and allows the antagonist muscle to roll up on the globe which it is compressing. But if the eye is pulled to one side by the antagonist, it has to be sustained on the other side in order that the stability of the center of rotation may not be compromised. It is in fact sustained by the common aponeurosis which shares in the traction exerted by the acting muscles and stretches like an elastic, concave cloth to support the eyeball."

From what has been said above it seems evident that the muscular apparatus does exert a certain influence and action on the eyeball and especially on the cornea. The question then suggests itself whether in cases in which the balance between the various parts of this apparatus has been altered, either by paralysis of some muscle or from the operation of strabotomy, the cornea may not undergo some modification in its shape. Opinions on this proposition are discordant and even contradictory to date.

As early as 1863 Knapp, after examining various cases in which strabotomy had been performed, declared that this operation has no influence on the curvature of the cornea. Noyes, however, affirmed that he had seen corneal astigmatism develop from tenotomy of the external and internal recti. Priestley-Smith relates a very interesting case of a lady with myopic astigmatism of 1 D. in the vertica meridian, which appeared suddenly, consecutive to rheumatic paralysis of the two recti, external and internal. With appropriate treatment the paralysis and with it the astigmatism, vanished in the course of a few days. In this case it was assumed that the diminished tonicity of the muscles of the horizontal plane of the eye had allowed the muscles of the vertical plane to slightly compress the eye along the vertical diameter, thus flattening the cornea on the horizontal and increasing the curvature on the vertical meridian.

Lacqueur, on the other hand, asserts that he has never noted any change in the curvature either with paralysis of the muscles or consecutive to squint operations, contrary, as he admits, to what might be anticipated. Swan Burnett has also recently announced the same conclusions. Panas is of the opinion that astigmatism may be diminished by a strabismus operation. Still more recently Ewers, of Leipsic, in a monograph on the development of astigmatism of the cornea, reports the results of his observations of 20 eyes before and after operations for convergent or divergent strabismus. He found no alterations in the curvature of the cornea in 14 cases. In 2 there was a decrease of .25 D. and an increase of the same amount in 2 others. Twice he noted an increase of .50 D., once on the horizontal and once on the vertical meridian. In these two cases alone, he observes, can the modications be imputed to the operation, as a difference of .25 D. between two ophthalmetric tests occurs even in normal conditions.

As a result of these conflicting statements the author decided to investigate the matter for himself. His 27 cases include 19 of simple tenotomy of the internal rectus, 6 tenotomies of the internal rectus and capsular advancement of the external, one case of tenotomy of the external rectus and one of simple external capsular advancement. The examinations were all made with the Javal ophthalmometer (Jobin make), 1894 model, and were repeated a number of times in the cases in which fixation was uncertain or difficult from any cause. A few cases in which there was some doubt in regard to the precision of the figures have been omitted from the statistics. The measurements in each case were always made by the same observer.

This present article was nearly completed when the author learned of a similar work communicated to the Society of Ophthalmology at Moscow by Auerbach. Melloni has not been able to obtain Auerbach's original article which, by the way, is abstracted in the *Annals of Ophthalmology* for April, 1900, p. 338. Auerbach's conclusions are:

1. Tenotomy of the internal rectus always induces increased astigmatism and refractive power in the vertical meridian. The refractive power in the horizontal meridian is increased in the cases in which the power of the vertical meridian was increased to a marked degree. In the other cases the refractive power in this meridian is diminished.

2. Tenotomy of the external rectus increases corneal astigmatism.

In two of his cases this phenomenon persisted ten months after the operation and six months later the condition was even more pronounced.

3. When tenotomy of one muscle is combined with advancement of another, the refracting power of the cornea diminishes in the two meridians and the cornea becomes flatter.

Again recurring to Melloni's cases, the 19 tenotomies of the internal rectus the operation produced no change in the corneal curves in seven. In one case no change was noticed six months afterward. In 7 other cases tenotomy of the internal rectus induced an increase in the curvature of the vertical meridian, ranging from a minimum of .20 D. to a maximum of 1.15 D. In this latter case the maximal increase occurred four months later, while a few days after the operation it was only .75 D. The maximal increase in the vertical meridian immediately after operation was 1 D. In 3 of these 7 cases the increase in the vertical meridian was accompanied by a diminution in the horizontal meridian and by a slight increase (.10), in one case. In the other cases the horizontal meridian was unaltered. The decrease in the horizontal meridian varied from a minimum of .25 to a maximum of .50. This did not necessarily coincide with greater increase in the vertical diameter, but occurred irregularly. In respect to another case tenotomy of the internal rectus produced a decrease of .40 D. in the horizontal diameter, leaving the vertical unaltered. Six months later, however, the variation of the horizontal diameter had disappeared, the curve returning to the condition in which it had been previous to the operation. In two cases the curvature was diminished in both meridians, more in the horizontal than in the vertical. In one instance this amounted to .25 D. on the vertical and .80 D. in the horizontal. In another it was 1.20 D. in the horizontal and 1 D. in the vertical. It should be mentioned, however, that in the former case the opthalmometric observation was not taken at once after the operation and the second examination was made ten months later. In another case the variations of the curves had a peculiar course, that is, the tenotomy of the internal rectus had induced an increase of .25 D. in the horizontal meridian and a decrease of .25 D. in the vertical. Four months later an increase of .50 D. over the first measurements in the horizontal meridian was noted, and an increase of .35 D. in the vertical. But as the vision was weak and

fixation uncertain in this eye, the measurements obtained may not have been correct and it is consequently not taken into account.

In the attempt to explain why in certain quite numerous cases there were no changes in the corneal curves after operation, while in others the curves were considerably modified, the author points out that we must first take into account the condition of the muscles. It was noticed that the tonicity of the muscles varied in different individuals. In the cases with less muscular tonicity and force it is natural that the compressing action exerted by the muscles on the eyeball is nearly null, and that the eyeball and the cornea feel no effect from them even after the equilibrium of the muscular apparatus has been altered by tenotomy. The reverse occurs, however, when the muscles are strong and elastic and in such cases the alterations may be of various kinds. The curvature generally increases in the vertical diameter. The mechanism of this increase can be readily explained by reflecting that when the internal rectus, the shortest of the muscles, is divided, the eyeball is compressed by the obliques, being only held in position by the superior and inferior recti. The external rectus offers practically no resistance as it is the weaker and longer muscle. It follows, thus, that the force exerted on the eyeball by the four recti in opposition to the two obliques, a force which was formerly distributed on the two meridians, is now exerted solely in the direction of the vertical meridian by the superior and inferior recti. The eyeball and with it the cornea, drawn by these two recti above and below, must be slightly compressed in the vertical diameter and expanded horizontally as the external and internal recti no longer pull on it from the sides. If besides this, we consider that by the shortening of the antero-posterior axis of the eyeball the latter rotating on itself assumes the same antero-posterior axis as the muscles, and that where formerly the muscles only embraced a portion of the eyeball they now embrace it all in its maximum diameter, and can thus make their action felt on the vertical meridian. If this explanation be the correct one, the vertical meridian becoming more curved and the horizontal flattened, the increased curvature in the vertical meridian should always coincide with a diminished curvature in the horizontal.

It is difficult to explain the findings in two cases where marked decrease in the horizontal meridian was accompanied by a decrease

in the vertical. Possibly the eyeball no longer constricted by the belt formed by the internal and external recti, was able to expand in this direction and hence the cornea became flattened horizontally, but how can we explain the similar decrease of curvature in the vertical meridian, unless possibly by a cicatricial process entailed by a wide tenotomy, which may have pulled on the tissues, the effects of which are difficult to estimate.

In six cases of tenotomy of the internal rectus combined with external capsular advancement, the curvature remained unaltered in one instance. In four others it diminished in the horizontal meridian from a minimum of .50 D. to a maximum of 1.50 D.

In all, with one exception, the diminished curvature in the horizontal was accompanied by a decrease also in the vertical meridian of from .10 to .50 D., and even in one case a decrease of .50 D. in the vertical meridian was discovered three months later. Thus it may be asserted that this operation almost always entails diminished curvature in both meridians, but chiefly in the horizontal.

The diminished curvature of the cornea consecutive to this operation is easily explained by reflecting that the eyeball is liberated from the constricting action of the internal rectus after it is divided. More than this these results must also be attributed in part to the effect of the advancement, which brings the point of application of the force much closer to the cornea, so that the latter feels the effect of it all the more since the muscle has been shortened and exerts greater traction. Analyzing the action of a rectus muscle we find that it is two-fold—traction on a tangent and on a perpendicular to the surface. The tangential traction has the effect of flattening the eyeball, while the perpendicular pulling compresses it into a curve at a given point. Studying the action of such forces in the contraction of a muscle, although we may not accept in toto Motais' opinion that the pressure on the eyeball of the muscle in contraction is neutralized by the tension of the tendinous expansion of the muscle itself —we see that as the eyeball is turned by a part of the muscle in contraction, the perpendicular force diminishes proportionately. In other words, the pressure of the muscle on the eyeball, while it increases the tangential force, causes the eyeball to rotate. If we consider, then, the action of a pair of muscles on the same plane, horizontal or vertical, we see that the tangential force of one is balanced

by an equal force on the part of the other. The eyeball would be flattened between them if it were not for the fact that the pressure on the eyeball from both compresses it and neutralizes the effect that the other force might have on the cornea. In the operation we are discussing the muscle has been shortened by advancement and thus causes the eyeball, by this shortening, to rotate. The cornea would feel the effect of the tangential force in an increased degree if it were not that the effect of it is counteracted by the severing of the internal rectus which diminishes or abolishes the pressure on the eyeball, of which this muscle is one, if not the chief, factor. It is clear then in this case, that as the force which tends to flatten the cornea is acting almost alone the effect is more pronounced than with simple tenotomy alone, even although this force may play but a small part in the flattening in the horizontal meridian.

Tenotomy combined with advancement produces flattening in the vertical meridian while with tenotomy alone there is increased curvature. This is certainly due to the retraction of the eyeball produced by the capsular advancement, a retraction which diminishes the effect of the compression of the eye by the superior and inferior recti.

In respect to one case treated by tenotomy of the external rectus, the results confirmed what was to have been anticipated, i. e., increased the curvature in the vertical meridian, as with tenotomy of the internal. Adding this to Auerbach's experiences the conclusions seem evident that this operation likewise entails increased curvature in the vertical meridian. The results obtained in another instance with simple external capsular advancement, should cause little surprise. In this case, besides the strabismus, the eye protruded more, so that the inter-palpebral fissure was abnormally wide. Shortening the external rectus drew the eye back and rendered the fissure less marked. The compression in the horizontal meridian was necessarily felt more as soon as the muscular belt was tightened and hence resulted an increased curvature of 1 D. in this meridian. It is more difficult to explain the increased curvature in the vertical meridian as one would suppose the retraction of the eyeball would have a tendency to diminish the curvature. But the increase was so slight as to be scarcely noticeable and may have been due to an error in the tests, or to the increased pressure of the lids which covered the eyeball more completely after the operation. It thus seems probable that capsular

advancement leads to an increase in the corneal curve on the meridian in which it is done.

So far we have spoken of increased or diminished curvature consecutive to strabismus operations, but another fact was learned from the ophthalmometric measurements described, which is also to be imputed to the operation in question, and that is a change in the position of the chief meridians. This is a fact which the author had not seen mentioned in any other work dealing with this subject.

They were not due to displacement of the head of the patient as might be suspected knowing the difficulty of obtaining accurate measurements on patients with squint, as they twist the head to secure better fixation. Even admitting slight errors from this cause it is impossible to accept it in the cases with 15 to 30 degrees variation, especially as the rotation of the eye neutralizes the twisting of the head to a certain extent. In fact if we borrow some figures from Ferri's recent publication on this much discussed but never solved question of the axial rotation or torsion of the eye with the lateral inclination of the body, we see that this "permanent rotation" of the eye causes it to follow the inclination of the head in the proportion of 4 to 7 degrees of inclination.

In case V, the examination was made ten months after the intervention. Case VII is remarkable, as the variation of 30 degrees did not occur until six months after the operation, the corneal curves remaining unaltered. The variation of 25 degrees observed in case XX was also noticeable, as it had been induced by a tenotonomy and advancement, supplemented later by a stitch in the lower external quadrant of the capsule to correct a remnant of superior convergent squint.

The number of these cases of variation of the meridians, although considerable, is scarcely sufficient for correct conclusions in regard to the manner in which the variations occur, nor to decide which operation is the most important factor in their production. But generally speaking they may be ascribed to the fact that in the tenotomy the aponeurotic expansion of the tendon was divided more extensively below than above or vice versa, according to the effect desired. Another plausible explanation is that the advancement established some points of attachment more solidly than others, or that the stitches held firmer in one place than another or that some stitches had to be loosened on account of over-correction. These causes may induce a pull-

ing and stretching in one direction or another which produce on the cornea the variations in the orientation of the meridians mentioned. Processes of cicatricial retraction may also be involved in the phenomenon, as we noted above that the variations in the meridians did not occur until several months after intervention.

Training a Physician in England—The cost to qualify for a doctor is between £700 and £1,200. So says the *British Medical Journal.* Most of the London hospital schools arrange that by paying a composition fee of from a little over £100 to £150, either in one sum or by installments, the student becomes a perpetual student, and is entitled to attend all necessary lectures and hospitals for the double diploma. Taking the larger sum for the purpose of estimate, and adding to it the necessary expenses for maintenance, clothing, books, anatomical parts, etc., at £100 a year for five years—a rather low estimate for London—the total cost of an ordinary student at a London hospital who qualifies at the conjoint board would be from £650 to £700; that of a university graduate would necessarily be greater and might amount to £1,000. If there is failure at any of the examinations the period of studentship is prolonged and the cost is increased.—*From the Westminster Gazette.*

Dr. Woolsey Hopkins, of this city, died on February 15 from pneumonia, at the age of 32 years. He was born in Alexandria, Va., and was graduated from the College of Physicians and Surgeons, New York, in the class of 1890. He was assistant surgeon to the Manhattan Eye and Ear Hospital, and was a member of the American Laryngological, Rhinilogical and Otological Society. A widow and two children survive him.—*New York Medical Record.*

The Maryland Ophthalmological and Otological Society elected Dr. Hiram Woods President and Dr. Henry O. Reik Secretary and Treasurer at its last annual meeting.

REPORTS OF SOCIETIES.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting, November 20, 1900. Dr. S. D. Risley, Acting Chairman, in the chair.

Dr. S. D. Risley exhibited a case of *abscess of the orbit following injury,* which proved to be associated with an opening into the ethmoidal cells, thus furnishing another illustration of the fact that suppurative disease of the orbit is usually associated with disease of one or more of the contiguous sinuses. The patient applied for treatment at the Wills Eye Hospital two days after a blow upon the nasal aspect of the upper eye-lid by a piece of flying metal. The upper lid was edematous, the conjunctiva chemotic, marked exophthalmos, and an almost fixed globe, only slight rotation inward remaining. Under cold compresses the pain promptly ceased, and the edema of the lids and exophthalmos disappeared, leaving only a point of tenderness at the upper and inner angle of the orbit. On the fifth day fluctuation was present, and a deep incision into the orbit was followed by profuse discharge of pus. A probe passed without resistance deeply into the orbit, showing a large area of denuded bone. The cavity was injected with peroxide of hydrogen solution and subsequently cleansed twice daily with saturated solution of boracic acid. The solutions passed freely into the nostril. Suppuration ceased after the first treatment and the wound healed without reaction or further suppuration. Mobility of the ball at the end of two weeks was completely restored and no tenderness remained. Dr. Risley found it difficult to explain the presence of the denuded bone, the opening into the ethmoidal cells, and the orbital suppuration following so speedily after the slight injury the boy received. There was no discoverable evidence in the nose of the ethmoidal disease having existed prior to the accident.

Drs. W. C. Posey and E. A. Shumway reported a case of *papilloma of the caruncle.* Although regarded by the text-books as a common affection, the authors were able to find but five cases with satisfactory microscopical description, to which they added the sixth. The patient, a man 60 years of age, presented a mulberry-shaped growth attached

by a pedicle to the right caruncle, and two similar growths on the palpebral conjunctiva near the lid margin. The growths were excised, and the loss of tissue replaced by a flap from the forehead. The resultant scar was slight and no recurrence has taken place, a year after operation. Microscopical examination showed a pedicle of connective tissue attached to the caruncle, from which proceeded numerous branches, each covered with a thick mantle of epithelial cells. The axial connective tissue was embryonal in character and contained thin-walled blood vessels. The caruncle showed a marked increase of the lymphoid cells found normally beneath the surface, and further irritation of the tissue was evidenced by the presence of numerous goblet-cells in the epithelium covering the caruncle, and in the mantles of cells composing the tumor. There was no extension of the growth beneath the surface of the caruncle. As malignant tumors clinically resembling papillomata, although anatomically quite distinct, are found in this situation, the authors believe that complete excision with cauterization of the base should always be advised.

Discussion.—Dr. de Schweinitz referred to a case of papilloma springing from the plica semilunaris which he had removed in April last. After excising the growth the base was cauterized with sulphate of zinc. There had been no recurrence. Dr. Randall exhibited a young colored boy from whom he had removed, a few hours previously, a small pigmented growth of the plica, which, when first seen, had the appearance of a foreign body. Dr. Veasey excised a growth of the caruncle several years ago which presented clinically the appearance of papilloma, but microscopically was shown to be a primary sarcoma. In another case a small reddish tumor about the size of a pin-head was shown under the microscope to be a cystic adenoma.

Dr. G. E. de Schweinitz described two cases of *intra-ocular metallic foreign bodies* which had been localized with the X-rays according to Sweet's method. In the one case the body was firmly imbedded in a mass of cicatricial tissue behind the ciliary body, where it had been for ten months, and although the magnet came in contact with the fragment it could not be moved. The eye was therefore enucleated, as sympathetic irritation had already set in. In the second case the foreign body was of unusual size, weighing 27 centigrammes, and was easily removed about twenty-four hours after the accident. The collapsed

eyeball was filled with physiological salt solution, the wound closed with catgut sutures, and there was uninterrupted recovery; that is to say, the eyeball was saved, although, of course, the vision was greatly depreciated, being only light-perception chiefly upon the nasal side of the field. He dwelt upon the uselessness of attempting to extract foreign bodies with the magnet if they had been long imbedded, on account of the firm adhesions which necessarily are formed, and urged the importance of prompt surgical intervention after accidents of this character, stating his belief that it is imperative that eyes in which there was the least suspicion of a foreign body should be submitted to expert examination, if necessary aided by the X-rays, so that no time shall be lost in localizing and extracting the foreign substance.

Dr. de Schweinitz also read a paper on "*A Word Concerning the Etiological Relationship of Epidemic Influenza to Chronic Glaucoma.*" After referring to the observation which has been made by several authors that there is an increased frequency of glaucoma during seasons in which influenza has manifested itself with unusual severity, he related a case of bilateral retrobulbar neuritis caused by this disease, in which he had observed the gradual formation of a cup in the optic nerve closely simulating that seen in so-called chronic or simple glaucoma. He suggested, therefore, that as a number of observations had shown that optic neuritis precedes plus tension and conduces to cupping of the disk, the retrobulbar neuritis of influenza might play this role and account for the etiological relationship that has been described.

Discussion.—Dr. Fenton referred to a patient he had seen six days after the beginning of an attack diagnosed by the attending physician as influenza, and found one eye of stony hardness, with cloudiness of the media, while the other eye exhibited chronic glaucoma. He believed that the super-intoxication of influenza induced glaucoma in eyes predisposed to the disease. Dr. Risley believed that granular changes in the macular region were often present in influenza, although he had never seen glaucoma associated with the affection.

Dr. M. W. Zimmerman reported a case of *left lateral homonymous hemianopsia* and subsequent marked partial reversal of the color and form limits, in a female domestic, aged 25 years, with fair general health and no history of injury. There had been a few epileptoid convulsions before and after admission to the Germantown Hospital on

June 3, 1899, apparently associated with delayed and painful menstruation. There was a retroverted and fixed uterus, but very little ovarian tenderness. The defect in the visual fields persisted for nearly a month, and for a time was accompanied by various extravagant hallucinations. With improvement of the pelvic conditions and general health all symptoms disappeared. Central vision had never been impaired and there were no lesions of the media or eye-grounds. Sixteen months after leaving the hospital the patient reported good health and no eye symptoms. The diagnosis of hysteria seemed justified by the temporary character of the visual defect, the peripheral contraction in the retained fields, and the marked reversal of form and colors after recovery; also by the close association with menstrual disorder and absence of central organic disease.

Discussion.—Dr. de Schweinitz said that he had been under the impression that hemianopsia was rare in hysteria, and was still of this opinion, notwithstanding that in a recent conversation a noted neurologist advised him that it was not an uncommon condition. In an experience extending over many years in the recording of fields of hysterical patients he had seen but three cases, only two of which, however, exhibited typical hemianopic fields.

Dr. C. A. Veasey reported a case of *traumatic luxation of the crystalline lens;* secondary glaucoma; extraction without loss of vitreous; recovery with normal vision. The lens had practically made a quarter-turn upon its axis, causing the edge to point directly forward, dividing the anterior chamber into two halves and lying against the posterior surface of the cornea. Under ether, a Bowman's needle was thrust through the cornea near the center of the upper inner quadrant and entered into the dislocated lens sufficiently far from the anterior edge to retain a firm hold without tearing loose. Using the cornea as a fulcrum, the handle of the needle was now brought forward and upward and held in this position by an assistant, thus depressing the lens directly downward and backward into the pupillary space until sufficient room had been cleared to allow the making of a downward section. Through the section a wire loop was introduced beside the lens, and by the combined movement of the transfixing-needle at the time of its withdrawal and a quarter-turn of the loop the lens was made to lie flatwise and was delivered without the loss of vitreous. With correcting lenses vision equaled 6-6, and Jaeger No. 1 was read.

Dr. H. F. Hansell reported a case of *hemorrhage from the conjunctiva* in an infant. The child at birth weighed 3½ pounds and was exceedingly puny and frail. For several days following birth there was a slight purulent discharge from the conjunctiva of both lids that disappeared under treatment by irrigation and mild antiseptics. Two weeks after birth bleeding from the conjunctiva commenced and continued for five days. The bleeding did not proceed from any one point, but oozed from the entire conjunctival surface of the left upper lid without cessation day or night. There was no anatomical change in the conjunctiva like that reported by Stoewer and others. The blood count showed 5,400,000 red and 5,600 white corpuscles; the percentage of hemoglobin could not be determined. The infant was put into an incubator and the temperature maintained at 99 degrees; its own temperature varied from 97 degrees to 104 2-5 degrees. Careful feeding and stimulants failed to kindle the feeble spark of life and after existing for five weeks it died. He thought that death was due to the premature birth, marasmus, and undeveloped bodily organs, and not to the loss of blood from the conjunctiva.

Discussion.—Dr. de Schweinitz recalled two cases, one of which he had previously reported. The other case occurred in a colored child, two weeks old, the hemorrhage coming from an isolated point on the bulbar conjunctiva of upper lid. After the usual styptics had failed to arrest hemorrhage, the bleeding point was picked up with hemostatic forceps. There was recurrence later, but recovery ultimately ensued. A few ecchymotic spots were found upon the body. In reply to a question, Dr. Hansell stated that it was uncommon to find the hemorrhage from isolated points, unless there was an organic lesion of the conjunctiva, but rather a leakage from the entire palpebral surfaces; oozing from the conjunctival surface being usually present.

WILLIAM M. SWEET,
Clerk of Section.

DENVER OPHTHALMOLOGICAL SOCIETY.

November 20, 1900.

DR. D. H. COOVER IN THE CHAIR.

The following cases were presented by Dr. Melville Black for examination: *A Piece of Steel in the Lens.* The patient was a man aged 26 years. Sixteen days ago while breaking a hole through a

brick wall with a hammer and chisel, he was struck in the right eye by a piece of steel broken from the hammer. Having caught in his hand a fragment of the hammer as it fell from his face, and as his eye did not seem to be damaged, the man continued working until eleven days after the accident. From the third day of the injury he had noticed the vision in his right eye was reduced. When first seen by Dr. Black, eleven days after the injury, the eye was free from injection. A small opacity was seen in the cornea just below the center. On dilating the pupil with homatropin, a piece of bright metal about 2 mm. square was plainly seen in the temporal periphery of the lens, by the aid of oblique illumination or with the ophthalmoscope. There was very little opacity of the lens, and the opacity was situated at the posterior pole and from thence towards the metal.

Exophthalmus, absence of the Lens and Iris with detachment of the Ciliary Processes and Retina Following an Injury to the Eyeball. The patient was a man aged 39 years, who had been struck in the right eye nine months ago by a falling box. The history was very obscure. It was impossible to learn anything of the extent of the primary injury. The case had come under Dr. Black's observation during the past week. There was now marked exophthalmus of the injured eye, in which vision was reduced to moving objects in the lower temporal field. The cornea was perfectly clear, and apparently larger than in the fellow eye. There was not a vestige of iris to be seen and catoptric examination showed absence of the lens. The ciliary process and retina were detached anteriorly except at the upper inner quadrant near the sclero-corneal junction. The tension was normal.

Dr. W. C. Bane presented for examination a case of *Vitreous Membrane* with vessels extending into it from the retina. The patient was a man aged 30 years, and several years ago had been under the care of Dr. Spalding, of Portland, Me., for retinal hemorrhages.

Dr. George F. Libby said he identified the patient as one he had seen many times in the out-patient department of Portland City Hospital. At that time there was no vitreous membrane, but there were several large retinal hemorrhages.

Dr. E. W. Stevens presented for examination a case of *Tobacco Amblyopia.* The patient was a man aged 41 years, in whom the failure of vision had come on suddenly eight days before. The vision in each

eye was now $\frac{4}{20}$. Six months ago with glasses his vision was O. D. $\frac{4}{4}$ O. S. $\frac{4}{9}$. There were found, five days ago, on examination, intact periplural visual fields and central scotoma for red and green in the right eye only. An examination at the present time showed the left eye to be similarly affected. There was no discoloration of the nerve heads or alteration in the retinal vessels. The urine was normal. The patient smoked a dozen strong cigars daily, but used alcoholic drinks sparingly.

Dr. W. C. Bane read a short note upon the *use of formalin in diseases of the eye.* As a collyrium he used it in the strength of 1 to 2,000, while for cleansing the conjunctival sac previous to operations, and as a bath for instruments during the operation, he used it in the strength of 1 to 500. These strengths of formalin were somewhat irritating, but the burning sensation produced soon subsided. The advantages formalin solutions possessed over most of the other antiseptics were: It is a reliable germicide. It is free from unpleasant odor. It does not have any injurious effects on the instruments.

Trikresol as an Ocular Antiseptic. Dr. Edward Jackson reported his experience with the 1 to 1,000 solution of Trikresol, to which his attention has been drawn by the paper of E. A. de Schweinitz published in 1894. He found that its instillation caused but a slight and brief sensation of burning, and no patient on whom it had been used showed any unfavorable idiosyncrasy toward it. He used such a solution as the menstruum for collyria of cocaine, eserin, and the mydriatics, except homatropin, for which the slight burning caused by it was objectionable where the instillations had to be repeated several times, while the solution being freshly made at short intervals, no antiseptic was necessary. Holocain was itself a sufficiently powerful antiseptic to keep its solution free from bacterial growths. He had also employed this solution extensively for cleansing the conjunctiva, as he had before used boric acid and normal salt solutions. In antiseptic value it seemed to rank with the mercurial solutions and formaldehyde; and was far less irritant. In all respects it had proved satisfactory, and apparently reliable. But he still resorted to sterilization by boiling for instruments and solutions to be used for cataract extraction and operations of that class.

Discussion of Dr. Bane's and Dr. Jackson's papers: Dr. Patterson

relied upon a solution of boric acid for cleansing the eye before operation.

Dr. Melville Black prepared his instruments for operations by first dropping them in carbolic acid and then in boiling water. He believed Holocain in a 1 per cent solution was a valuable antiseptic, and with it had had excellent results in the treatment of corneal ulcers, particularly phlyctenular ulcers. General practitioners should be taught to substitute holocain for cocaine, which they now use in nearly all diseases of the eye. When he desired a deep and penetrating effect, Dr. Black preferred the use of a 20 per cent solution of protargol. He would not use protargol in preparing the eye for an operation. He used it in corneal ulcers and after removing a foreign body from the cornea.

Dr. Coover cleaned his instruments with Parke Davis' soap and hot water, and placed them in distilled water before operating. He cleaned the lids and lashes carefully with a 1 to 1,000 solution of bichloride and flushed the conjunctival sac with normal salt solution.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held Nov. 13, 1900, in the rooms of the Chicago Medical Society, with Dr. J. E. Colburn in the chair.

Dr. Oscar Dodd presented a case of *Probable Hyaline Infiltration of the Cornea.* Mrs. M., aged 39 years, gives a history of having at two years of age had a severe inflammation of the cornea with frequent subsequent attacks lasting one or more days at a time. She was able to read and sew quite well until about six months ago. Her health has always been good.

Her condition two weeks ago was as follows: There were several grayish white translucent spots, 1 to 2 mm in diameter, on each cornea. They presented a smooth surface, but raised above the level of the cornea. There was a great deal of blepharospasm and photophobia. The upper part of the cornea showed the result of old ulcerations.

The spots were scraped off the right cornea with a sharp curette. They came off easily, with the exception of one to the temporal side, which left the surface rough and evidently involved the deeper tissue. They were hard and felt almost as though there was calcareous infiltration.

Dr. Dodd has seen three other similar cases. One was a man who had had an operation for a pterygium followed by a number of cauterizations. The growths had extended over nearly the whole cornea and his vision was reduced to the perception of shadows. It separated from Bowman's membrane, leaving almost a clear cornea. The other two cases had each a single spot on the cornea.

As to the pathological conditions giving rise to this condition it is probably a hyaline infiltration taking place in the epithelium at the site of old scars. Dr. Dodd could find nothing in the literature regarding it except a statement by Nuel that such a condition had been seen.

Dr. E. A. Lawbaugh believes that the condition looks like a deposition of hyaline bodies in the cornea, but prefers to defer a positive diagnosis until the report of the pathologist has been received.

Dr. Dodd, in closing, said that a careful search of the literature failed to reveal anything on the subject in question. There are conditions, such as band-shaped keratitis, which are very similar to this one. In one case which he has seen, the infiltration extended all through the cornea, and the spots in the deeper layers of the cornea were so small that it required a magnifying glass to see them. On Bowman's membrane and just beneath it there was a calcareous deposit, which he removed. It did not come off like the deposit in this case, as it was adherent. The degenerations and changes are very similar to those in pterygium. The case following the pterygium was probably due to the irritation of the primary disease.

Dr. Dodd presented a case of *Argyrosis from Protargol.* The argyrosis followed the use of a strong solution of protargol applied to the conjunctiva with a brush for many months, followed by a weak solution used as a collyrium. The staining is quite marked in this as well as several other cases in the hospital. An interne in the hospital was using protargol on some cases of trachoma, and its application was followed by distinct discoloration of the conjunctiva in each case. This patient has also been operated upon for ectropion. The elliptical-shaped incision was made in the margin of the canthus, and Snellen's stitch used in both eyes. The result in the left eye is good, in the right eye only partial.

Dr. C. P. Pinckard said that there was no doubt that protargol produces argyrosis. He uses a five to twenty per cent solution, applied with a cotton swab, and has had quite a few cases of argyrosis follow.

Dr. William H. Wilder presented *two cases of severe iritis*. The first was a man, forty-one years old, Hollander, with a good family and personal history. Knows of no tuberculosis or cancer, and has never had venereal disease. When twelve years old he had some trouble with one eye, but remembers very little about it. In 1882 he had an inflammation of the left eye, he says, similar to the present condition. The right eye was not affected. He says his sight was poor, but recovered perfectly after the subsidence of the inflammation. The acuity of vision of the right eye was not tested at the time. In 1891 he had another attack, but not as severe as the present one, and not affecting the right eye. The attack from which he completely recovered lasted for some time, and he wore protective glasses for months. The present attack began about the middle of June, with soreness of the right eye, photophobia, lachrymation and temporal headache. There was circum-corneal injection and a decided discoloration of the circum-corneal area outward and upward. The cornea at the upper and outer part shows an old scar. The pupil is about three millimeters in diameter, and does not react to light. He left the infirmary and returned in October, with very poor sight of the left eye, and complained of severe pain in the eye and head, so severe as to prevent sleep. The condition of the eyes has not changed since that time. There was marked chemosis, cornea hazy and rough, with yellowish-white infiltration in the borders of the cornea, thickening and infiltration of the episcleral tissue, as in episcleritis. The thickening and infiltration of the episcleral tissue is so great that the conjunctiva seems to overlap the cornea. The pupil is about medium in size and regular in outline. It does not react to light, and will not dilate with atropine. There is distinct infiltration at the root of the iris with yellowish-gray masses and intense ciliary injection. Examination of the heart and lungs was negative. The tuberculin test was used three times, but the result was practically negative. Only once did the temperature rise to 100 degrees. There was no cough. At the right apex there is possibly a prolonged and high-pitched respiratory sound. Otherwise the physical examination was negative.

The second case was a case of syphilis, the initial lesion of which occurred 13 months ago. There was a marked maculo-papular syphilide, considerable glandular enlargement, and other symptoms of the disease. After 4 months after the chancre, he developed a severe iritis of the right eye, the marks of which may be seen on the anterior capsule of

the lens. Five weeks ago the right eye again became inflamed, and now there is to be seen an infiltration of the cornea of the right eye, at the inner limbus, with ulcer. There are also two small nodes, about 1 mm. in diameter, on the cornea, of recent date, which are quite transparent. This inflammation of the cornea has developed in the last few weeks, and is probably dependent upon the syphilis. Although many books do not speak of lesions of the cornea occurring in acquired syphilis, this is the fourth case of the kind seen by Dr. Wilder. It is not unlike a condition one sees in aggravated cases of phlyctenular marginal keratitis.

Dr. Henry Gradle inquired whether salicylate of soda had been used in the first case. It very often stops such cases, whether due to rheumatism or not. It has more influence on cases of cyclitis than any other drug.

Dr. Oscar Dodd said he saw but one case similar to the one presented. It was one of specific iritis in which the proliferation or exudate in the anterior chamber was almost identical in appearance to this. They occurred at the margin and part way back on the iris, and they filled the anterior chamber nearly half full. The case went on to partial recovery, but there was so much exudation that only a part of it was absorbed.

Dr. E. A. Lawbaugh saw the case six weeks ago, when there were a few infiltrations in the sclera, but they were nearly all confined to the limbus.

Dr. C. P. Pinckard said that this infiltration of the sclera was very questionable. He had a case about a year ago, which he called gumma of the sclera. In spite of enormous doses of potassium iodide, it became necessary to remove the eye.

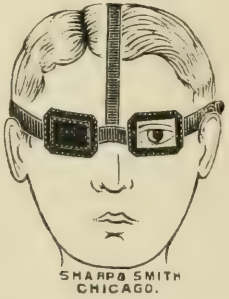
Dr. Henry Gradle said that he had often noticed that iritis occurring with a papular syphilide, especially lichen, is much more persistent than an iritis occurring with a non-papular simple cutaneous eruption like a roseola.

Dr. Wilder, in closing, said that the appearance in the first case is suggestive of tubercular iritis. He saw a somewhat similar case in Moorfield's Hospital in the service of Nettleship. Tuberculin injections gave no reaction. It finally became necessary to excise the eye, and microscopical examination showed a typical round-cell growth, with typical giant cells in the iris and in the little masses of exudate in the anterior chamber.

Dr. William E. Gamble preented a case of *Opaque Nerve Fibers With Myopia.*

Dr. Gamble said this young lady had opaque nerve fibers in left eye. No other changes in fundus. There is also myopia of 4 D. in this eye. He presented this case for the reason that it is unusual to find myopia and opaque nerve fibers present in same eye.

Dr. Henry Gradle showed an *eye-bandage* which cannot become displaced when well applied. When intended for both eyes, it consists of a rectangular pad of muslin over each eye, the two being united by a bridge of broad tape across the nose. Broad tape, fastened to the edges of the pads, encircles the head above the ears, and is either tied or buckled at the temple. From the bridge of the nose another band of tape runs sagittally over the head, meeting the transverse tape behind. After adjustment to the patient's head, this is pinned or stitched. Each eye-pad is kept from being distorted by the traction of the tape by means of pieces of whalebone (natural or artificial) with rounded corners inserted at the vertical edges.



If the bandage is to be used for one eye only, the pad for the normal eye is made a skeleton frame, which the vertical whalebones keep in shape. The patient's view through this frame is unobstructed.

Slipping of this bandage is prevented by the whalebones next to the nose, by the support of the tape by the ears, and by the band reaching from the nose to the middle of the back of the head. According to patients' statements, it is the most comfortable of all forms of eye bandage.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Thursday, November 8, 1900.

C. ANDERSON CRITCHETT, M. A., F. R. C. S. E., PRESIDENT.

Dr. W. Ernest Thomson read a paper on the *determination of the influence of the eye on the growth of the orbit by experimental enucleation of one eye in young animals.* He stated that this research was undertaken in order to determine whether removal of an eye in early life results in faulty development of the orbit. Such faulty development has been both asserted and denied, although experimental evidence has, seemingly, been hitherto wanting. One eye in a series of rabbits was enucleated under ether about the twentieth day of life. The animals were kept for periods varying from six to eight months and were then killed. The orbits were carefully measured and the results found to be a very marked difference between the normal and the anophthalmic side. The deficiency is very uniformly distributed over the length, height and depth of the orbit and amounts to something like 10 per cent in the macerated skull and from 10 to 15 per cent in the wet condition.

It thus appears that the greater fault is in the development of the bones and the lesser in that of the soft tissues. Lantern slides were shown which brought out the various points and the skulls were themselves exhibited.

The President thought the paper one of great interest and practical importance. He strongly advocated the insertion of artificial eyes early.

Dr. Gruber thought that the attachment of the muscles to the eyeball and the increased blood supply consequent on the normal functions of the orbit being exercised had far more to do with the development of the orbit than had the mere presence of an artificial eye in the conjunctival sac.

Dr. Thomson briefly replied.

Mr. Norman C. Bennett read a paper on the *Aetiology of Lamellar Cataract.* He introduced the subject by referring to the measurements of lenses taken by Bernand Duband and Treacher Collins either ophthalmoscopically during life or after removal of the lens, from which it

appeared that the diameter of the opaque zone was never larger than that of the lens at birth and that therefore either the lesion was occasioned before birth or the part affected was not the most peripheral at the time of its occurrence. He then described the structure of the hypoplastic teeth usually associated with lamellar cataract and detailed the dates of calcification of the two dentitions according to the investigations of Röse, showing what parts of the teeth might be affected by any cause acting during the first two years of life. Mr. Bennett described minutely the teeth as they existed in twenty-two cases of lamellar cataract which he had collected. They naturally fell into two classes on the basis of the extent of enamel affected, but in both classes it appeared evident, if the facts were taken in conjunction with the dates of calcification as investigated by Röse, that the affection had its commencement almost immediately after birth. Its period varied considerably in one class of cases, and appeared to be about two years in the other larger class. The exact causation had long been a matter for discussion. After referring to the various causes that had been suggested from time to time, Mr. Bennett described a large number of cases of hypoplastic teeth showing that among those not associated with lamellar cataract the same uniformity of type was not met with, the determining cause of the defect obviously having occurred at a much later date in a large number of cases. From a number of cases with definite histories he showed that this latter type of tooth was frequently though not always the result of an exanthematous fever, whereas those more frequent cases of teeth affected soon after birth were often associated with a history of convulsions and general disturbance of health of an indefinite kind. Sometimes the teeth would have two or more horizontal depressions corresponding with a series of definite attacks of illness. The inference was, then, that lamellar cataract was a disease of early infantile life occasioned by some general derangement of health, the most probable being errors of diet and nutrition. In emphasizing this conclusion Mr. Bennett referred to the developmental similarity between lens and enamel and cited an opinion of Mr. Collins to show that the inferences he drew were not necessarily inconsistent with those afforded by the measurement of lenses referred to above, but that lamellar cataract might be the result of contraction of the nucleus of the lens some time after birth.

The President asked Mr. Bennett whether he had noticed the

disease to occur in many members of the same family, and he recounted a case which had occurred in his own practice in which there was a very strong family history. The father suffered from lamellar cataract, two of his children were affected with the disease, he has or had seven cousins affected as well as one niece and two sisters.

Mr. Treacher Collins had investigated ten cases of congenital cataract, but in none of them was the enamel defective.

Mr. John Griffith expressed his strong opinion that the disease was a congenital and not an infantile one.

Mr. Bennett briefly replied and in answer to the President's question he stated that he had not carefully investigated the family history.

The following card specimens were shown:

Mr. Simeon Snell: *Epithelioma of the Cornea.* The patient was a soldier aged 45 with a history of injury seven years ago. In May, 1898, it was removed, but it recurred. Mr. Snell first saw the patient in August, 1900, when the growth filled the interpalpebral space. The eyeball was enucleated and the growth shown to be an epithelioma.

Mr. John Griffith: *Specimen of Osteosarcoma of the Orbit.*

Mr. Treacher Collins and Mr. Vernon Ford: Case of bullet wound of the orbit followed by blindness of both eyes. The patient was with Admiral Sir E. H. Seymour's expedition for the relief of Pekin. He was shot through the head with a bullet and it was found that in one eye the choroid was ruptured while in the other the retina was detached.

Mr. A. W. Ormond: *Chancre of the Upper Lid at the retrotarsal fold.*

At the last meeting of the Philadelphia Pathological Society Drs. George E. de Schweinitz and Edward A. Shumway reported two interesting cases of Glioma of the Retina.

It is a pleasure to mention that Dr. Albert B. Hale, of Chicago, has recovered from his illness and returned to Chicago after a European trip and has again resumed his active practice.

NEWS ITEMS.

Personally the items of interest should be sent to Dr. Frank Allport, 92 State St, Chicago.

Dr. L. Bach has accepted a professorship at Marburg.

At Graz Dr. Birnbacher has been appointed full professor.

Dr. Gross has been made Extraordinary Professor at Budapest.

Dr. George F. Fisk, of Chicago, has returned from his European trip.

Prof. Everbusch, of Erlangen, has accepted a professorship at Munich.

Dr. Bach of Wurzburg has been appointed Professor in Ordinary at Marburg.

Prof. Oeller in Munich has been appointed Professor in Ordinary at Erlangen.

Dr. Lyman Ware, of Chicago, has recently had his house robbed by burglars.

Dr. Von Grosz has been appointed Professor of Ophthalmology at Budapest.

Dr. F. B. Eaton, of San Francisco, has removed his office to 590 Sutter street.

Dr. Axenfeld has declined the appointment at Marburg as successor of Prof. Hess.

Dr. H. O. Reik has recently been elected Recording Secretary of the Clinical Society of Maryland.

Dr. Frank E. Tull has been appointed Oculist and Aurist to Blessing Hospital of Quincy, Ill.

Dr. Thorington has beeen appointed Professor of Ophthalmology in the Philadelphia Policlinic.

Dr. Frederick M. Pendleton has been appointed Consulting Oculist and Aurist to the same hospital.

At McGill University, Montreal, Dr. S. W. Stirling has beeen appointed Lecturer in Ophthalmology.

Prof. Everbusch at Erlangen has been appointed successor to Prof. A. V. Rothmund (resigned) in Munich.

Dr. O. Kuhne, who is so well known to the ophthalmic world from his researches in Retinal Purple, is dead.

At the last meeting of the Minnesota State Medical Society, Dr. McDavitt, of St. Paul, was elected Secretary.

The A. Von Grafe triennial prize has been awarded to Prof. Hess at Wuerzburg, and Dr. St. Bernheimer in Vienna.

The death of Dr. G. E. Williamson is announced. He was surgeon to the eye department, Royal Infirmary, Newcastle-on-Tyne.

Dr. Hugh E. Jones, M. R. C. S. L. C. P. P., has been appointed Honorary Surgeon to the Eye and Ear Infirmary at Liverpool.

Dr. Frank L. Henderson, of St. Louis, has removed his office to the Centure building, northwest corner of Ninth and Olive streets.

Dr. David De Beck has recently been appointed Professor of Ophthalmology in the Cincinnati College of Medicine and Surgery.

At the annual election of officers for the ensuing year the Hot Springs Medical Society elected Dr. Randolph Brunson President.

Dr. Franz Shiek, of Halle, has completed a monograph on "The CClinical and Experimental Study of the Tuberculins in Iris Tuberculosis."

Dr. Leslie M. Hoyt, Sycamore, Ill., who sued the city for $20,000 for injury to an eye from the overhanging limb of a tree, has settled for $1,800.

At the annual meeting of the Directors of the May Fletcher Hospital, Burlington, Vt., Dr. Marshall C. Twitchell was appointed Ophthalmologist.

Dr. Theodore von Schroeder has received the appointment of Director of the Ophthalmic Institute at St. Petersburg, in succession to Dr. Magawly.

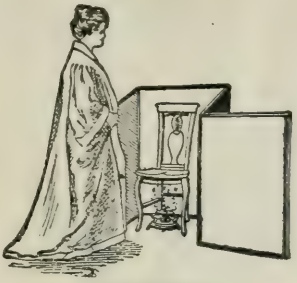
The Carbondale (Pa.) Hospital has reorganized its staff. Dr. William W. Fletcher has been given charge of the Eye, Ear and Throat Department.

Dr. Morax was chosen, by the Concourse, Ophthalmologist for the hospitals of Paris. This is an innovation and it promises much for French Ophthalmology.

Dr. J. E. Weeks, of New York City, is Chairman of the Ophthalmological Section of the Pan-American Congress which meets in Havana next February.

The Oakland (Cal.) College of Physicians and Surgeons has been incorporated. Dr. H. G. Thomas has been elected Professor of Ophthalmology and Otology.

FRISCH'S MEDICATED

Bath  Cabinet

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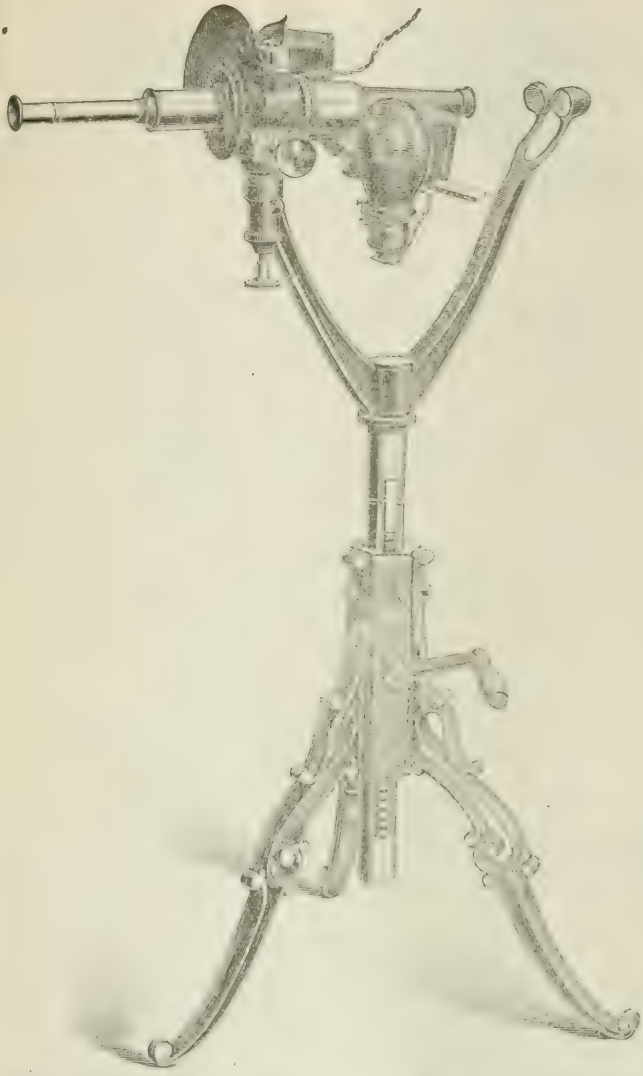

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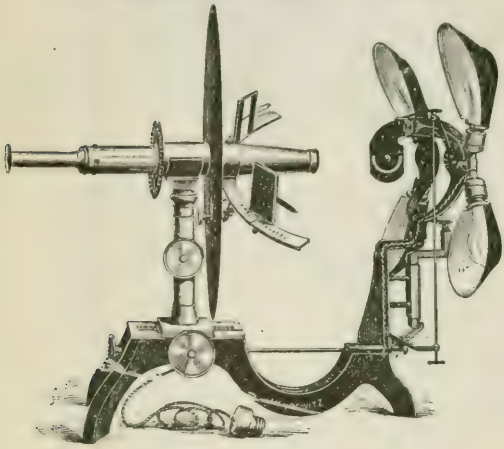

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